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## Definitions and Acronyms

Affected Water User (or AWU) (Env-Ws 1902.03) means a water user required to be registered under Env-Wr 700, or successor rules, and having a withdrawal or return location within 500 feet of a designated river or within 500 feet of a river or stream in its tributary drainage area.

Aggregate Water Use (Env-Ws 1902.04) means the total water use by all affected water users at, and upstream from, any location on a designated river, being the difference between the sum of water withdrawals and the sum of measured registered water returns. Aggregate Water Use is averaged for a month and may not represent withdrawal and return of water conditions during any one day.

cfs means cubic feet per second. One cfs is equal to 7.4814 gallons per second or 448.9 gallons per minute.

cfsm means cubic feet per second of flow per square mile of stream drainage area. This is a means of comparing streamflow per unit area (square miles).

7Q10 means the lowest average flow rate for a 7-day period on an annual basis with an expected recurrence interval of once in every 10 years, determined for a location on a river or stream, and expressed in terms of volume per time period, usually in cfs.



Designated River means a river or river segment that is designated under RSA 483.

Discharge - A discharge is a return of water to the environment usually to the subsurface like a septic field or directly to a surface water body by a registered water user. Discharges have WUSD\_ID (Water User Source or Discharge Identification Number) like 20057 20057-D01, where the first number (20057) represents the water user's identification number and the second, hyphenated number (20057-S02) represents the water user's discharge location. In this case D01 indicates the first or only discharge location of this facility. Water users may have more than one registered discharge.

Gage means a stream flow measurement station on a river. (Yes, the spelling looks wrong, but that's how it's spelled.)

General Standard (Env-Ws 1902.10) means a quantitative method for assessing aggregate water use at any river location relative to stream flow at that location.

(c) A designated river shall be not in compliance with the general standard if:

- (1) The average monthly aggregate water use exceeds 5 percent of 7Q10 when average monthly stream flow is less than or equal to 0.5 cfs;
- (2) The average monthly aggregate water use exceeds 0.02 cfs when average monthly stream flow is greater than 0.5 cfs and less than or equal to 1.0 cfs;
- (3) The average monthly aggregate water use exceeds 0.04 cfs when average monthly stream flow is greater than 1.0 cfs and less than or equal to 4 cfs; or
- (4) The average monthly aggregate water use exceeds 0.16 cfs when average monthly stream flow is greater than 4 cfs.

Impact Point Use means the incremental water use change at a single point on a Designated River. An impact point is the location where water use first affects the Designated River. An impact point may be a single surface water withdrawal from the Designated River, or the point where groundwater would enter the Designated River if it had not been captured by a well, or the confluence of a tributary where water is being used with the Designated River. Impact Point Use where a tributary enters the Designated River may include water use from several water user sources or withdrawals, and is equal to the sum of these uses.

Return means the release of water to the environment, as defined in Env-Wr 101.36. The Instream Flow Rules require that returns assessed in this report be registered (under Env-Wr 700 or successor rules) and measured.

Source – A source is a withdrawal location usually from a well or surface water body. Sources have WUSD\_ID (Water User Source or Discharge Identification Number) like 20057 20057-S02, where the first number (20057) represents the water user's identification number and the second, hyphenated number (20057-S02) represents the water user's source of the withdrawal. In this case S02 indicates the second source of this facility. When the first and second numbers do not match, such as 20351 20061-S01, this indicates that water is transferred from the source

of the water user identified by the second number to the water user identified by the first number as in the case of a municipal water system delivering water to an institution or factory. Water users may have more than one registered source.

WMPA (Water Management Planning Area) (Env-Ws 1902.16) means the tributary drainage area to a Designated River for which a Water Management Plan is required.

Withdrawal – removal of water from the environment by means of a well or surface water intake. The Instream Flow Rules require assessment of registered (under Env-Wr 700 or successor rules) withdrawals within 500 feet of a Designated River or on of its tributaries.

## **2003 Annual Report of Water Use versus Stream Flow on Designated Rivers**

### **I. Introduction**

Instream flow is one of the key protection measures provided under the Rivers Management and Protection Act (RSA 483). RSA 483 gives the Department of Environmental Services the authority and responsibility to maintain flow to support instream public uses in rivers that have been designated by the Legislature for special protection under the Act. In 2002, a broad coalition of New Hampshire business and conservation interests joined together to enact compromise legislation which became Chapter 278, Laws of 2002 (from House Bill 1449-A) that calls for a pilot program for instream flow protection. With the advice and input of the statewide Rivers Management Advisory Committee (RMAC), DES adopted Instream Flow Rules (Env-Ws 1900) effective May 29, 2003. One provision of the Instream Flow Rules is the annual reporting of water use versus streamflow for the Designated Rivers. Please refer to <http://www.des.state.nh.us/rules/Env-Ws1900.pdf> to read a copy of these rules.

The Instream Flow Rules (Env-Ws 1903.02) require assessment of water use and streamflow for each Designated River. Env-Ws 1903.02(e) requires a report each year on aggregate water use and streamflow. This is the first of those annual reports. There were fourteen Designated Rivers defined in the Rivers Management and Protection Act (RSA 483) in 2003 as shown in the map below.

The Instream Flow Rules require the annual report to include:

- (1) An estimate of water use for each Affected Water User;
- (2) An estimate of aggregate water use at each withdrawal or return location;
- (3) An estimate of stream flow at each withdrawal or return location;
- (4) A record of the month(s) and location(s) not in compliance with the General Standard for Designated Rivers without established Protected Instream Flows under Env-Ws 1905;
- (5) A description of the WMPA[Water Management Planning Area] for Designated River(s) that are not in compliance with the General Standard; and
- (6) For each Designated River with protected instream flows established under Env-Ws 1905, a record of the date(s) and location(s) at which protected instream flows were not maintained.

The first part of this report describes the methods used to develop the information required in the rules. The first section of the methods describes estimation of water use and aggregate water use for each Affected Water User. The next section describes the estimation of monthly stream flow values that are used, as described in the next section, to define the General Standard flow for each month. The last section describes the method for comparison of streamflow with the General Standard.

Following the description of methods is a Watershed Management Planning Area Report for each of the fourteen Designated Rivers. Each Watershed Management Planning Area Report describes the results of the 2003 assessment. Included in each WMPA Report is a description of the gages and numbers of water users in the WMPA. The WMPA report includes a narrative description of the times and locations where the General Standard was not met during 2003. A

map showing the locations of gages and water use sources and discharges in the WMPA is included. This is followed by a series of tables in the following order.

- 1) Table of Water Use - A listing of monthly water use in cfs by source and discharge for each AWU in the WMPA. These sources and discharges are ranked by the drainage areas of the impact point on the Designated River.
- 2) Table of Aggregate Water Use - Aggregate water use for each impact point is estimated by adding upstream water use to water use at each impact point.
- 3) Table of Estimated Monthly Stream Flow and General Standard - Estimated values for monthly streamflow and the monthly General Standard for the Designate River are described as flow per unit area (cubic feet per square mile of drainage area, aka cfs/m). In some cases, where there is more than a single gage measuring the Designated River, there are different values for various parts of the Designated River.
- 4) Table of General Standard - The General Standard at each impact point has been calculated. The General Standard values in monthly flow per unit area (cfs/m) are multiplied by the drainage area of each impact point to determine the General Standard as a flow in cubic feet per second specific to that location.
- 5) Estimated Margin of Aggregate Water Use below the General Standard - At each impact point, the General Standard for each month is subtracted from the estimated monthly stream flow. The result is the amount of flow between the monthly stream flow and the General Standard. Where a negative value occurs, the monthly streamflow at that impact point is less than the General Standard. These are the impact points where the Designated River is not in compliance with the General Standard.

Each WMPA report includes up to twelve monthly graphs showing the General Standard compared to the impact point water use and aggregate water use. The General Standard criteria increase with increasing streamflow, therefore the graph shows the General Standard criteria increasing as estimated streamflow increases in the downstream direction. The impact point water use identifies incremental water use where one or more Affected Water Users first affects the Designated River. The Aggregate Water Use is the sum of upstream water use by Affected Water users at that impact point.

### **Summary of 2003 Water Use Versus General Standard for NH Designated Rivers**

There are no Protected Instream Flow values adopted at this time. When Protected Instream Flow values are established, Designated Rivers will be assessed against their specific Protected Instream Flow values. All rivers were assessed against the General Standard determined by assessing average monthly streamflow for that Designated River or portion of Designated River. \_\_\_ of the Designated Rivers were in compliance with the General Standard. Aggregate Water Use exceeded the General Standard criteria in \_\_\_ of the Designated Rivers. The table below shows the 2003 General Standard compliance status of the Designated Rivers.

<b>Designated River Name</b>	<b>Months Not In Compliance with the General Standard</b>
Souhegan	July, August, September
Lamprey	July, August, September
Ashuelot	July
Cold	None
Connecticut	
Contoocook	
Exeter	July, August, September
Isinglass	
Merrimack (Lower)	
Merrimack (Upper)	
Pemigewasset	
Piscataquog	
Saco	
Swift	



## **II. Methods**

No Protected Instream Flows have been established at this time, so all assessments will be made against the General Standard. The General Standard is a reference tool for comparatively evaluating water use on Designated Rivers where Protected Instream Flows have not yet been established. A river is not in compliance with the General Standard, as defined in Env-Ws 1903.01, if:

- (1) The average monthly aggregate water use exceeds 5 percent of 7Q10 when average monthly stream flow is less than or equal to 0.5 cfs;
- (2) The average monthly aggregate water use exceeds 0.02 cfs when average monthly stream flow is greater than 0.5 cfs and less than or equal to 1.0 cfs;
- (3) The average monthly aggregate water use exceeds 0.04 cfs when average monthly stream flow is greater than 1.0 cfs and less than or equal to 4 cfs; or
- (4) The average monthly aggregate water use exceeds 0.16 cfs when average monthly stream flow is greater than 4 cfs.

### **A. Water Use and Aggregate Water Use Estimates**

Water use data are available from the NHDES Water Use database for registered water users. Registration is required under the Water Use Registration and Reporting Rules for water users who use more than 140,000 gallons per week in any year. Monthly water use data are submitted by the water users to the Department either quarterly or annually. The Department records these data in the Water Use Database and a data link to the Department's Geographic Information System (GIS) coverages is updated periodically. This annual report uses the monthly water use estimates from the data linked to the GIS coverage on April 14, 2004.

Every effort was made to use reported data for this report however in a number of instances data was not available for the 2003 calendar year. Data for the end of the year was occasionally missing because of delinquent reporting. In some cases, data for individual months was missing. Where data was missing from the GIS link, queries to the original data source, the Water Use data base, were made. To complete the data set for 2003, missing water use data was populated by interpolation from the months before and after the missing point or by using trends or averaged data from previous years' water use reports. The choice of method was based on the most reasonable expectation of water use given the Department's understanding of the water use type.

Estimates of water use by Affected Water Users and aggregate water use by Affected Water Users are required in this Annual Report. Affected Water Users are defined in the Instream Flow Rules (Env-Ws 1900). Affected Water Users are water users required to be registered under the Water Use Registration and Reporting Rules, or their successor rules. However, the Instream Flow Rules include as AWUs only those registered water users with a

source or discharge within 500 feet of the Designated River or a tributary. There were \_\_\_\_ Affected Water Users in 2003 who were identified and included in this report.

Under the Instream Flow Rules, monthly aggregate water use must be assessed versus average monthly streamflow. Aggregate water use is defined as the total water use by all affected water users at and upstream from any location on a designated river, being the difference between the sum of water withdrawals and the sum of measured, registered water returns. Measured registered water returns exclude water uses such as irrigation, where the intent is for the water to be taken up and used by the plants. Also, excluded are uses where water losses or water return cannot or is not measured. However, where water use is a pass-through without expectation of losses, such as at a hydroelectric dam, water returns were calculated as equal to the inflow.

Effects of withdrawals and returns on the Designated River were assessed at every impact point. An impact point is where the water use affects the Designated River. Water withdrawals and returns may occur on the Designated River or on a tributary. A withdrawal or return directly from the Designated River has an impact point at that withdrawal location. A withdrawal that occurs upstream of the Designated River is migrated downstream along the nearest tributary to its confluence with the Designated River. In this case, the impact point is where the tributary intersects the Designated River because this is where the water use affects the Designated River. A tributary to the Designated River may include one or several affected water users resulting in a single impact point for all upstream withdrawals and returns occurring at the point where the tributary meets the Designated River. If the water use is a well within 500 feet of the Designated River, the impact point is the point where a surficial flow line from the well meets the Designated River. This is meant to represent the point where groundwater would enter the River if the well were not withdrawing water.

Water use on the Designated River is aggregated at each source or discharge location and also at each end of the Designated River. Aggregate Water Use is assessed against the General Standard. Aggregate water use is calculated by combining the difference between the sum of water withdrawals and the sum of measured registered water returns at each water use location (impact point) on the Designated River. To assess aggregate water use, a process must be followed to define the water users' monthly water use in the same terms as the General Standard as it is described in the rules. The General Standard compares water use to streamflow in terms of cubic feet per second per square mile of drainage area (cfs/m).

To generate aggregate water use data for this assessment, first, monthly water use for each Affected Water User's source or discharge is queried through the GIS link to the Water Use Database. The Water Use database defines water use locations as a source or as a discharge. Water use for sources are expressed as positive numbers and water use for discharges are expressed as negative values to represent water returned to the Designated River. These sources and measured discharges are ranked by the drainage area of their impact point on the Designated River. Water uses upstream of the end of the Designated River will have their impact point drainage area equal to that of the upstream end of the Designated River. Water use that derives its source from a transfer of water is not aggregated. Transferred water was counted as a withdrawal at the original withdrawal location.



## B. Stream Flow Estimates

This report includes values for monthly stream flow at the impact points on the Designated Rivers. It also uses monthly stream flows for assessment of the General Standard criteria. Impact points are the locations on the Designated River where a withdrawal or return of an Affected Water User affects the Designated River. Stream flow estimates in this report rely on the concept that streamflow will vary uniformly with drainage area. This is not always true especially as one goes to much larger or much smaller drainage areas than the reference data. In this report, the reference points for stream flow are the drainage gages. Streamflow estimates will be most accurate at locations closest to the gage. Future reports will refine the measurement of stream flow by incorporating developing regression methods.

### Stream Flow Data Source

Streamflow values for this Annual Report were taken from the USGS website which provides “recent daily” data on a provisional basis (<http://waterdata.usgs.gov/nh/nwis/current/?type=flow>), meaning they are preliminary and have not received final approval by USGS. Recent daily data is downloaded from the stream gage web pages. These data include dates and daily mean flows in cubic feet per second, which are then imported to Excel worksheets.

Gages are first selected from the active, total record stream gages on a Designated River. Partial record gages may be used where no total record gages are available. Partial record gages may not be well calibrated for measuring low flows because their main use is measurement of high flows. Gages within the Water Management Planning Area (the watershed area of the Designated River), but not on the Designated River, are used as surrogates when no other gages are available. Gages in other basins may be used where no gages are active in the Water Management Planning Area.

Where a surrogate was necessary, gages were identified that are within watersheds similar to the watersheds of the ungaged Water Management Planning Area. Drainage basin size, elevation, and location were used as the criteria to identify a set of possible surrogate gages. Surrogate gages were used in two ways. One way was to compare the surrogate gage’s flow to a historically active gage in the WMPA using linear regression. The regression equation was then used to create data for the historical data location using recent data from the surrogate gage. The second use of surrogate gages was used if no coincident data in the Water Management Planning Area is available to compare to the surrogate gage’s data. If this was the case, the surrogate gage’s data was used as the data for the Water Management Area and applied at a point in the Water Management Planning Area with the same drainage area. The gages used for the fourteen Designated Rivers are identified below.

### **Gages for each DR for 2003 GS Flow transposition**

#### Ashuelot

<a href="#">01158000</a>	ASHUELOT RIVER BELOW SURRY MT DAM, NEAR KEENE, NH
<a href="#">01160350</a>	ASHUELOT RIVER AT WEST SWANZEY, NH
<a href="#">01161000</a>	ASHUELOT RIVER AT HINSDALE, NH

## Cold

### Surrogate station at

<a href="#">01154000</a>	SAXTONS RIVER AT SAXTONS RIVER, VT
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## Connecticut

<a href="#">01129200</a>	CONNECTICUT R BELOW INDIAN STREAM NR PITTSBURG, NH
<a href="#">01129500</a>	CONNECTICUT RIVER AT NORTH STRATFORD, NH
<a href="#">01131500</a>	CONNECTICUT RIVER NEAR DALTON, NH
<a href="#">01138500</a>	CONNECTICUT RIVER AT WELLS RIVER, VT
<a href="#">01144500</a>	CONNECTICUT RIVER AT WEST LEBANON, NH
<a href="#">01154500</a>	CONNECTICUT RIVER AT NORTH WALPOLE, NH

## Contoocook

<a href="#">01085500</a>	CONTOOCCOOK R BL HOPKINTON DAM AT W HOPKINTON, NH
<a href="#">01086000</a>	WARNER RIVER AT DAVISVILLE, NH
<a href="#">01087850</a>	CONTOOCCOOK RIVER AT RIVER HILL, NEAR PENACOOK, NH

## Exeter

<a href="#">1073587</a>	EXETER RIVER AT HAIGH ROAD, NEAR BRENTWOOD, NH
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## Isinglass

### Surrogate stations at

<a href="#">01073500</a>	LAMPREY RIVER NEAR NEWMARKET, NH
<a href="#">01072800</a>	COCHECO RIVER NEAR ROCHESTER, NH.
<a href="#">01073000</a>	OYSTER RIVER NEAR DURHAM, NH
<a href="#">01073587</a>	EXETER RIVER AT HAIGH ROAD, NEAR BRENTWOOD, NH

## Lamprey

<a href="#">01073500</a>	LAMPREY RIVER NEAR NEWMARKET, NH
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## Merrimack (Lower)

<a href="#">01092000</a>	MERRIMACK R NR GOFFS FALLS, BELOW MANCHESTER, NH
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## Merrimack (Upper)

<a href="#">01081500</a>	MERRIMACK RIVER AT FRANKLIN JUNCTION, NH
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## Pemigewasset

<a href="#">01075000</a>	PEMIGEWASSET RIVER AT WOODSTOCK, NH
<a href="#">01076500</a>	PEMIGEWASSET RIVER AT PLYMOUTH, NH
<a href="#">01078000</a>	SMITH RIVER NEAR BRISTOL, NH
<a href="#">01081000</a>	WINNIPESAUKEE RIVER AT TILTON, NH

## Piscataquog

### Surrogate stations at

<a href="#">01094000</a>	SOUHEGAN RIVER AT MERRIMACK, NH
<a href="#">01082000</a>	CONTOOCOOK RIVER AT PETERBOROUGH, NH
<a href="#">01085500</a>	CONTOOCOOK R BL HOPKINTON DAM AT W HOPKINTON, NH

## Saco

<a href="#">01064500</a>	SACO RIVER NEAR CONWAY, NH
<a href="#">01064300</a>	ELLIS RIVER NEAR JACKSON, NH

## Souhegan

<a href="#">01094000</a>	SOUHEGAN RIVER AT MERRIMACK, NH
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## Swift

<a href="#">1064500</a>	SACO RIVER NEAR CONWAY, NH
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### Monthly Stream Flow Data Processing

Monthly mean streamflows were estimated for 2003 using the daily mean streamflow data downloaded for the selected gages from the USGS website to an EXCEL worksheet. Some gages have data missing for one to as many as all days in a month. This frequently is the result of iced over conditions, which render the rating curve inaccurate. Missing daily data were replaced with Period-of-Record mean daily streamflow values or with linearly interpolated values if there were fewer than five consecutive days missing. Monthly average values were then calculated from the daily values for 2003 populated with these actual, interpolated, or historical mean daily values.

Where no active gages were identified in the Water Management Planning Area, such as for the Cold River, date was created or adopted. The Cold River gage is inactive. A surrogate data set was created for 2003 from a nearby gage on the Saxton River in Vermont. These gages have similar basin size, elevation, and location. They also have 38 years of contemporaneous data collection. Monthly average flows for each gage were paired for the period when both gages were active. A comparison of flows was then conducted by running a linear regression on each month's data pairs for the mutually active period to calculate slope and intercept values. A monthly average for the inactive gage on the Cold River was then estimated for 2003 using the monthly averages from the active surrogate gage recalculated with the regression equation. Where no historical gage was available for regression, data from a surrogate gage was adopted from nearby watersheds. The surrogate stream flow was usually averaged from at least two gages, which was converted to a cfsm value and applied to the target river.

Stream flow at each impact point is determined by areal transposition methods. Monthly average stream flows in cubic feet per second were converted to cfsm by dividing out the gage's drainage area in square miles. This yields a stream flow value per unit area (square mile). The drainage areas of each impact point can then be multiplied by this flow value to yield the average monthly stream flow at each location. Between two gages, where more than a single gage might apply to an impact point, interpolation of the stream flow at each gage is used. The watershed area

between the two gages is measured and the ratio of that area above and below the impact point is used as the ratio of the monthly stream flow from each gage.

$$AMS_{(ip)} = \left\{ \left( \left[ 1 - \frac{[DA_{(ip)} - DA_{(ug)}]}{[DA_{(dg)} - DA_{(ug)}]} \right] * AMS_{(ug)} \right) + \left( \left[ 1 - \frac{[DA_{(dg)} - DA_{(ip)}]}{[DA_{(dg)} - DA_{(ug)}]} \right] * AMS_{(dg)} \right) \right\} * DA_{(ip)}$$

Where:

$AMS_{(ip)}$  = average monthly stream flow at an impact point between gages

$DA_{(ip)}$  = drainage area of the impact point in square miles

$DA_{(ug)}$  = drainage area of the upstream gage in square miles

$DA_{(dg)}$  = drainage area of the downstream gage in square miles

$AMS_{(ug)}$  = average monthly streamflow of the upstream gage in cfs;

$AMS_{(dg)}$  = average monthly streamflow of the downstream gage in cfs

Some of the Designated Rivers include other Designated Rivers as tributaries. Where two Designated Rivers meet, the resulting cfs value is the average cfs of each Designated River weighted by their drainage areas.

### C. General Standard Determination

The General Standard is a quantitative way to evaluate water use among streams of different sizes and characteristics. The General Standard is not a Protected Instream Flow, but criteria for evaluating levels of water use in watersheds of very different sizes. General Standard defines water use criteria defined as flow per unit area derived from estimated monthly streamflow values. By comparing water use this way, the General Standard acts as a means of assessing water use versus stream flow that is comparable on all the Designated Rivers.

Aggregate Water Use must be compared to criteria in the General Standard. The criteria in the General Standard are expressed as values in cfs or as 5% of the 7Q10 value. Both types of values are drainage basin-size dependent. To calculate the General Standard for the impact points in the watershed, a per unit area value is determined at a gage location based on the measured or surrogate streamflows. At each gage location, monthly average stream flow is converted to a per unit area value in cfs by dividing the flow by its drainage area. Streamflow in cfs is then compared to the four tiers of the General Standard, which are listed above as described in Env-Ws 1903.02 (c) of the Instream Flow Rules. Aggregate Water Use under the General Standard in cfs is determined for each month using the average monthly flow at each gage.

### 7Q10 calculations

The stream flow statistic known as 7Q10 represents the flow that is the lowest 7-day average flow with a recurrence interval of 10 years. Values for each gage were usually taken from values

derived by USGS for gages with sufficient periods of record. These data and the USGS methods can be found at

[http://www.des.state.nh.us/rivers/instream/Archive/pourpt/Gage\\_Pourpoint\\_20010327.xls](http://www.des.state.nh.us/rivers/instream/Archive/pourpt/Gage_Pourpoint_20010327.xls) and <http://www.des.state.nh.us/rivers/instream/Archive/pourpt/compute.htm>. Additional values were taken from USGS WRI 02-4298, "Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams."

Where 7Q10 values were calculated for this report, the one of the following methods was selected. The first method was to convert 7Q10 values from nearby gages from cfs to cfsm values. These values were averaged and converted back to cfs for the gage. The results were checked against the daily stream flows for the period of record to ensure they fell within the Q95 to Q98 range of flows. A second method was to calculate a 7Q10 for the gage of interest. Daily data was collected from the gage. Centered, seven-day, running averages were calculated for each day of complete calendar years in the period of record. The annual minimum values were extracted and sorted by magnitude from lowest to highest. These values were ranked and a Weibull transformation  $[(n+1)/\text{rank}]$  was used to generate recurrence intervals for each value. The 10-year recurrence interval was interpolated from the resulting array.

#### **D. Comparison of Aggregate Water Use with the General Standard**

The Aggregate Water Use and the General Standard criteria are determined for each impact point on the Designated River. Aggregate Water Use is the sum of the average monthly reported values for sources and measured discharges upstream of that impact point. The General Standard criteria determined based on the average monthly stream flow at the impact point. At the locations and times (months) that the Aggregate Water Use exceeds the General Standard criteria, the river is not in compliance with the General Standard. These locations and times are identified in the individual reports for each WMPA under Part V.

#### **IV. Watershed Reports**

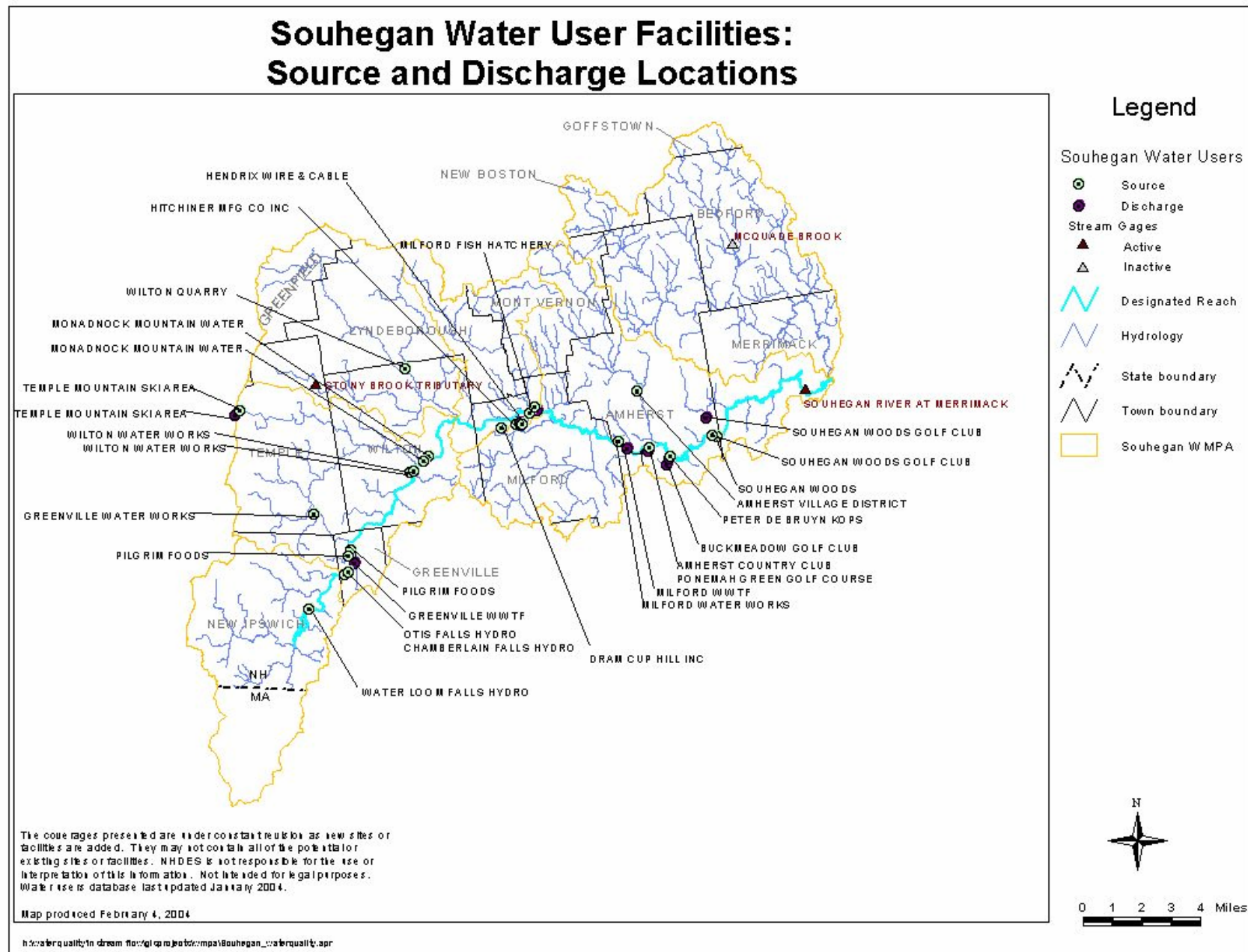
##### **A. Souhegan Annual Water Use versus Stream Flow – Calendar Year 2003**

The Souhegan Water Management Planning Area covers 220 square miles and includes a streamflow gage in Merrimack (USGS 01094000 SOUHEGAN RIVER AT MERRIMACK, NH) measuring 171 square miles of the drainage area. For this report the streamflow was transposed areal from this gage to all impact points on the Designated River. There are 23 registered sources and 10 registered, measured discharges in the Water Management Planning Area..

There are three months when the General Standard was exceeded. The exceedences occurred during July, August and September. In July, the aggregate monthly water use exceeds the General Standard from Wilton Water Works in Wilton to the start of the Designated River in Merrimack. In August, the aggregate monthly water use exceeds the General Standard between the Milford Fish Hatchery withdrawals and its return of water from the hatchery. In September, the aggregate monthly water use exceeds the General Standard from Wilton Water Works in Wilton to the discharge at the Milford Waste Water Treatment Works and again between the Amherst Country Club and the start of the Designated River in Merrimack.

The Water Management Planning Area includes water use by hydroelectric facilities. These facilities are run of the river. Water use by hydroelectric facilities are not shown in the monthly graphs because flow in is expected to equal flow out and because the general Standard does not apply to hydroelectric facilities between their point of withdrawal and point of return per Env-Ws 1903.02(d). Other water users include municipal and community water supplies in Greenville, Wilton, Milford, and Amherst. There is a food processing plant in Greenville and a bottled water plant in Wilton. There is industrial use at a quarry in Wilton. In the past there was agricultural use in Amherst, but it was not active in 2003. Three golf courses in Amherst are water users. The State's Fish Hatchery withdraws water from wells in Milford.

# 1. Souhegan WMPA Map





Water Use in CFS																
USERNAME	FACILITY	DA on DR (SQ MILE)	DR MILE	SD_ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-D01	(31.075)	(34.404)	(31.075)	(32.110)	(31.075)	(32.110)	(31.075)	(31.075)	(32.110)	(31.075)	(32.110)	(31.075)
GREENVILLE WWTF	GREENVILLE WWTF	30.97	28.16	20086-D01	(0.206)	(0.326)	(0.384)	(0.395)	(0.326)	(0.330)	(0.221)	(0.230)	(0.208)	(0.232)	(0.273)	(0.302)
PILGRIM FOOD	PILGRIM FOOD	31.51	28.04	20681-S04	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PILGRIM FOOD	PILGRIM FOOD	31.55	27.90	20681-S03	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PILGRIM FOOD	PILGRIM FOOD	31.64	27.61	20681-S02	0.013	0.014	0.025	0.023	0.016	0.020	0.026	0.024	0.028	0.019	0.028	0.021
GREENVILLE TOWN	GREENVILLE WATER WORKS	38.84	27.38	20047-S03	0.165	0.172	0.176	0.177	0.184	0.211	0.212	0.199	0.192	0.220	0.171	0.159
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S02	0.129	0.123	0.127	0.126	0.134	0.173	0.153	0.161	0.127	0.124	0.121	0.129
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S01	0.129	0.131	0.131	0.109	0.149	0.150	0.226	0.146	0.136	0.132	0.120	0.159
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	63.75	24.04	20621-S02	0.047	0.052	0.047	0.051	0.049	0.051	0.050	0.050	0.052	0.046	0.047	0.046
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	64.06	23.77	20621-S01	0.047	0.052	0.047	0.051	0.049	0.051	0.050	0.050	0.052	0.046	0.047	0.046
PIKE INDUSTRIES INC	WILTON QUARRY	99.47	21.48	20281-S01	0.000	0.000	0.000	0.043	0.051	0.060	0.130	0.088	0.109	0.038	0.039	0.000
NH FISH & GAME	MILFORD FISH HATCHERY	104.18	17.90	20218-S01	2.562	2.562	2.562	2.562	2.562	2.562	2.562	2.562	2.562	2.562	2.562	2.562
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-S02	1.225	1.225	1.225	1.170	1.170	0.624	1.225	1.225	1.225	1.114	1.114	1.114
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-D01	(3.787)	(3.787)	(3.787)	(3.732)	(3.732)	(3.186)	(3.787)	(3.787)	(3.787)	(3.676)	(3.676)	(3.676)
MILFORD WATER WORKS	MILFORD WATER WORKS	139.01	13.66	20100-S01	1.470	1.452	1.391	1.454	1.525	1.601	1.591	1.656	1.561	1.379	1.328	1.344
MILFORD WWTF	MILFORD WWTF	139.97	13.04	20092-D01	(2.002)	(1.955)	(3.223)	(3.207)	(2.655)	(2.360)	(1.617)	(1.715)	(1.579)	(1.693)	(1.959)	(1.949)
PONEMAH GREEN GOLF COURSE	PONEMAH GREEN GOLF COURSE	141.69	11.97	20624-S01	0.000	0.000	0.000	0.000	0.008	0.033	0.090	0.053	0.018	0.000	0.000	0.000
AMHERST COUNTRY CLUB	AMHERST COUNTRY CLUB	141.69	11.97	20190-S01	0.000	0.000	0.000	0.000	0.051	0.158	0.470	0.292	0.098	0.025	0.000	0.000
PENNICHUCK WATER WORKS	AMHERST VILLAGE DISTRICT	155.19	11.55	20000-S01	0.051	0.030	0.049	0.130	0.153	0.200	0.223	0.109	0.099	0.065	0.047	0.061
PETER DE BRUYN KOPS	PETER DE BRUYN KOPS	156.21	10.69	20383-S01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PENNICHUCK WATER WORKS	SOUHEGAN WOODS	160.55	7.76	20659-S01	0.034	0.034	0.030	0.041	0.027	0.080	0.116	0.103	0.086	0.018	0.008	0.007
SOUHEGAN WOODS GOLF CLUB	SOUHEGAN WOODS GOLF CLUB	160.64	7.60	20523-S01	0.000	0.000	0.000	0.000	0.092	0.088	0.347	0.200	0.122	0.028	0.000	0.000
START OF DESIGNATED REACH	START OF DESIGNATED REACH	219.72	0.00													



2003 Souhegan Aggregate Water Use in CFS																
USERNAME	FACILITY	DA on DR (SQ MILE)	DR MILE	SD_ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
END OF DESIGNATED REACH	END OF DESIGNATED REACH	21.07	33.22		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-S01	21.733	24.062	21.733	22.458	21.733	22.458	21.733	21.733	22.458	21.733	22.458	21.733
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-D01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-S01	24.957	27.630	24.957	25.788	24.957	25.788	24.957	24.957	25.788	24.957	25.788	24.957
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-D01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-S01	31.075	34.404	31.075	32.110	31.075	32.110	31.075	31.075	32.110	31.075	32.110	31.075
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-D01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GREENVILLE WWTF	GREENVILLE WWTF	30.97	28.16	20086-D01	(0.206)	(0.326)	(0.384)	(0.395)	(0.326)	(0.330)	(0.221)	(0.230)	(0.208)	(0.232)	(0.273)	(0.302)
PILGRIM FOOD	PILGRIM FOOD	31.51	28.04	20681-S04	(0.206)	(0.326)	(0.384)	(0.395)	(0.326)	(0.330)	(0.221)	(0.230)	(0.208)	(0.232)	(0.273)	(0.302)
PILGRIM FOOD	PILGRIM FOOD	31.55	27.90	20681-S03	(0.206)	(0.326)	(0.384)	(0.395)	(0.326)	(0.330)	(0.221)	(0.230)	(0.208)	(0.232)	(0.273)	(0.302)
PILGRIM FOOD	PILGRIM FOOD	31.64	27.61	20681-S02	(0.192)	(0.313)	(0.359)	(0.372)	(0.310)	(0.310)	(0.195)	(0.206)	(0.180)	(0.213)	(0.244)	(0.281)
GREENVILLE TOWN	GREENVILLE WATER WORKS	38.84	27.38	20047-S03	(0.027)	(0.141)	(0.184)	(0.195)	(0.126)	(0.099)	0.017	(0.008)	0.012	0.007	(0.073)	(0.121)
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S02	0.101	(0.018)	(0.057)	(0.069)	0.008	0.074	0.169	0.153	0.139	0.131	0.047	0.007
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S01	0.231	0.113	0.073	0.040	0.157	0.223	0.396	0.299	0.275	0.262	0.167	0.167
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	63.75	24.04	20621-S02	0.277	0.164	0.120	0.091	0.206	0.274	0.446	0.349	0.327	0.308	0.215	0.212
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	64.06	23.77	20621-S01	0.324	0.216	0.167	0.142	0.255	0.325	0.496	0.399	0.378	0.354	0.262	0.258
PIKE INDUSTRIES INC	WILTON QUARRY	99.47	21.48	20281-S01	0.324	0.216	0.167	0.185	0.307	0.385	0.625	0.486	0.488	0.392	0.300	0.258
NH FISH & GAME	MILFORD FISH HATCHERY	104.18	17.90	20218-S01	2.886	2.778	2.729	2.747	2.869	2.947	3.187	3.048	3.050	2.954	2.862	2.820
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-S02	4.112	4.003	3.954	3.917	4.038	3.571	4.412	4.274	4.275	4.068	3.976	3.934
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-D01	0.324	0.216	0.167	0.185	0.307	0.385	0.625	0.486	0.488	0.392	0.300	0.258
MILFORD WATER WORKS	MILFORD WATER WORKS	139.01	13.66	20100-S01	1.795	1.669	1.558	1.639	1.832	1.987	2.216	2.143	2.048	1.771	1.628	1.602
MILFORD WWTF	MILFORD WWTF	139.97	13.04	20092-D01	(0.208)	(0.287)	(1.665)	(1.568)	(0.823)	(0.374)	0.599	0.427	0.469	0.077	(0.330)	(0.347)
PONEMAH GREEN GOLF COURSE	PONEMAH GREEN GOLF COURSE	141.69	11.97	20624-S01	(0.208)	(0.287)	(1.665)	(1.568)	(0.814)	(0.341)	0.688	0.481	0.488	0.077	(0.330)	(0.347)
AMHERST COUNTRY CLUB	AMHERST COUNTRY CLUB	141.69	11.97	20190-S01	(0.208)	(0.287)	(1.665)	(1.568)	(0.763)	(0.183)	1.159	0.772	0.586	0.102	(0.330)	(0.347)
PENNICHUCK WATER WORKS	AMHERST VILLAGE DISTRICT	155.19	11.55	20000-S01	(0.157)	(0.257)	(1.617)	(1.438)	(0.610)	0.017	1.382	0.882	0.684	0.168	(0.283)	(0.286)
PETER DE BRUYN KOPS	PETER DE BRUYN KOPS	156.21	10.69	20383-S01	(0.157)	(0.257)	(1.617)	(1.438)	(0.610)	0.017	1.382	0.882	0.684	0.168	(0.283)	(0.286)
PENNICHUCK WATER WORKS	SOUHEGAN WOODS	160.55	7.76	20659-S01	(0.123)	(0.223)	(1.587)	(1.396)	(0.582)	0.097	1.498	0.985	0.771	0.185	(0.275)	(0.279)
SOUHEGAN WOODS GOLF CLUB	SOUHEGAN WOODS GOLF CLUB	160.64	7.60	20523-S01	(0.123)	(0.223)	(1.587)	(1.396)	(0.491)	0.185	1.845	1.184	0.893	0.214	(0.275)	(0.279)
START OF DESIGNATED REACH	START OF DESIGNATED REACH	219.72	0.00		(0.123)	(0.223)	(1.587)	(1.396)	(0.491)	0.185	1.845	1.184	0.893	0.214	(0.275)	(0.279)

#### 4. Estimated Monthly Stream Flows and General Standard Values

##### USGS 01094000 SOUHEGAN RIVER AT MERRIMACK, NH

DA(mi^2) 171

7Q10 (cfs) 13

	Mean of daily streamflows (2003) in cfs	Mean of monthly streamflows (POR=69 years) in cfs	Median of monthly means (cfs)	Calculated Monthly mean CFSM	General Standard in cfsm
Jan-03	268	268	241	1.57	0.04
Feb-03	271	271	225	1.59	0.04
Mar-03	891	624	549.5	5.21	0.16
Apr-03	817	769	734	4.78	0.16
May-03	537	379	375	3.14	0.04
Jun-03	342	213	149.5	2.00	0.04
Jul-03	52	101	66.95	0.30	0.0038
Aug-03	123	77.5	46.8	0.72	0.02
Sep-03	71	88.2	46.1	0.41	0.0038
Oct-03	209	107	60.7	1.22	0.04
Nov-03	330	223	157.5	1.93	0.04
Dec-03	657	282	243.5	3.84	0.04

2003 daily data availability

81.9%

	Using POR average streamflow for this month
	Using interpolated values or POR average daily

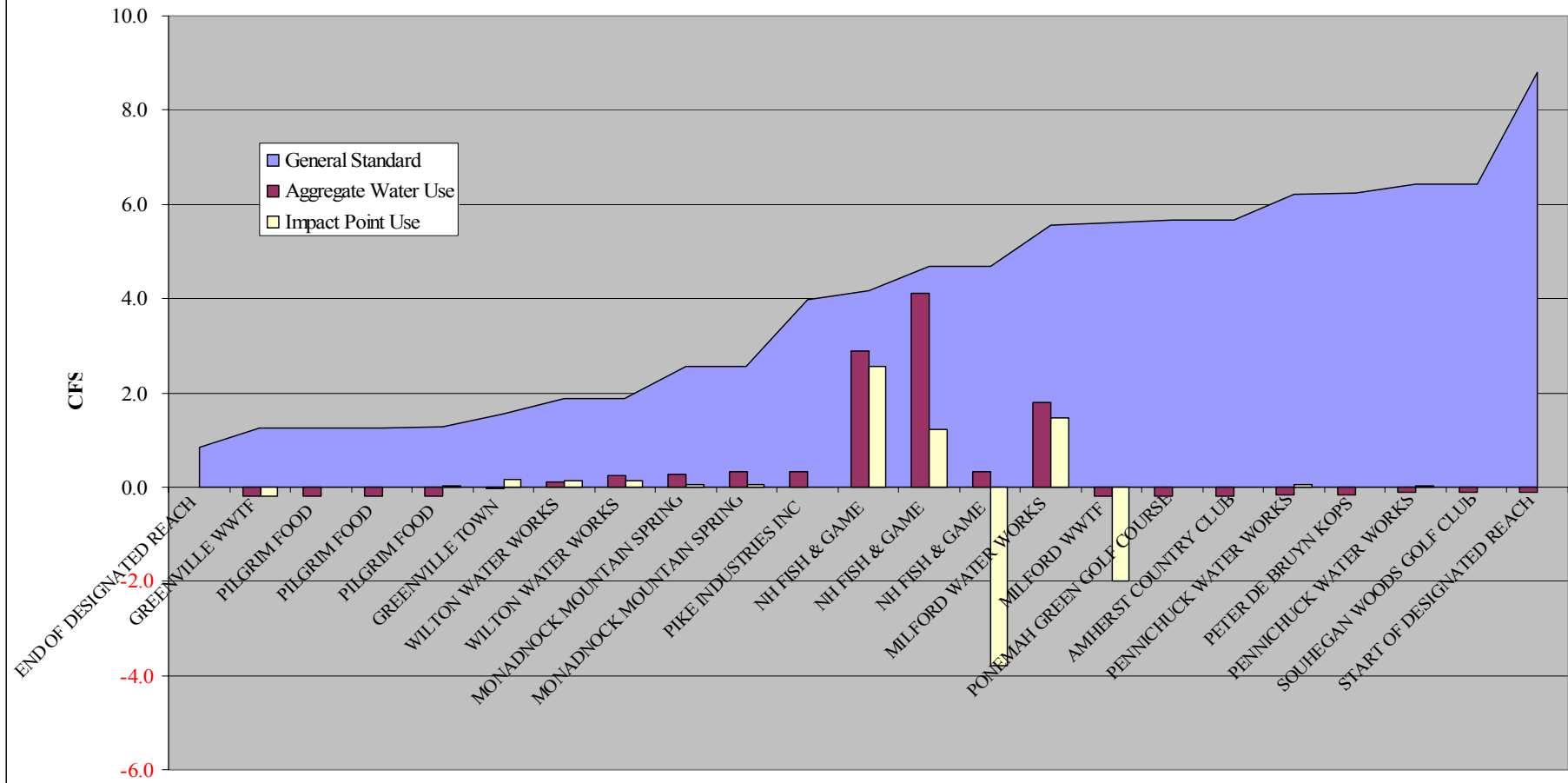
Estimated Monthly Stream Flow at Each Impact Point in CFS				Calculated Monthly mean stream flow CFSM												
					1.57	1.59	5.21	4.78	3.14	2.00	0.30	0.72	0.41	1.22	1.93	3.84
USERNAME	FACILITY	DA on DR (SQ MILE)	DR MILE	SD_ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
END OF DESIGNATED REACH	END OF DESIGNATED REACH	21.07	33.22		33	33	110	101	66	42	6.4	15	8.7	26	41	81
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-S01	35	36	118	108	71	45	6.9	16	9.4	28	44	87
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-D01	35	36	118	108	71	45	6.9	16	9.4	28	44	87
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-S01	46	47	153	141	92	59	9.0	21	12	36	57	113
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-D01	46	47	153	141	92	59	9.0	21	12	36	57	113
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-S01	46	47	154	142	93	59	9.0	21	12	36	57	114
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-D01	46	47	154	142	93	59	9.0	21	12	36	57	114
GREENVILLE WWTF	GREENVILLE WWTF	30.97	28.16	20086-D01	49	49	161	148	97	62	9.4	22	13	38	60	119
PILGRIM FOOD	PILGRIM FOOD	31.51	28.04	20681-S04	49	50	164	151	99	63	10	23	13	39	61	121
PILGRIM FOOD	PILGRIM FOOD	31.55	27.90	20681-S03	49	50	164	151	99	63	10	23	13	39	61	121
PILGRIM FOOD	PILGRIM FOOD	31.64	27.61	20681-S02	50	50	165	151	99	63	10	23	13	39	61	122
GREENVILLE TOWN	GREENVILLE WATER WORKS	38.84	27.38	20047-S03	61	62	202	186	122	78	12	28	16	48	75	149
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S02	73	74	244	223	147	93	14	34	19	57	90	180
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S01	73	74	244	223	147	93	14	34	19	57	90	180
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	63.75	24.04	20621-S02	100	101	332	305	200	127	19	46	26	78	123	245
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	64.06	23.77	20621-S01	100	102	334	306	201	128	20	46	26	78	124	246
PIKE INDUSTRIES INC	WILTON QUARRY	99.47	21.48	20281-S01	156	158	518	475	312	199	30	71	41	122	192	382
NH FISH & GAME	MILFORD FISH HATCHERY	104.18	17.90	20218-S01	163	165	543	498	327	208	32	75	43	128	201	401
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-S02	184	186	611	561	368	234	36	84	48	144	227	451
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-D01	184	186	611	561	368	234	36	84	48	144	227	451
MILFORD WATER WORKS	MILFORD WATER WORKS	139.01	13.66	20100-S01	218	220	724	664	436	278	42	100	57	170	269	534
MILFORD WWTF	MILFORD WWTF	139.97	13.04	20092-D01	219	222	729	669	439	280	43	100	58	171	270	538
PONEMAH GREEN GOLF COURSE	PONEMAH GREEN GOLF COURSE	141.69	11.97	20624-S01	222	225	738	677	445	283	43	102	59	174	274	545
AMHERST COUNTRY CLUB	AMHERST COUNTRY CLUB	141.69	11.97	20190-S01	222	225	738	677	445	283	43	102	59	174	274	545
PENNICHUCK WATER WORKS	AMHERST VILLAGE DISTRICT	155.19	11.55	20000-S01	243	246	808	741	487	310	47	111	64	190	300	597
PETER DE BRUYN KOPS	PETER DE BRUYN KOPS	156.21	10.69	20383-S01	245	248	814	746	490	312	48	112	65	191	302	600
PENNICHUCK WATER WORKS	SOUHEGAN WOODS	160.55	7.76	20659-S01	252	255	836	767	504	321	49	115	66	197	310	617
SOUHEGAN WOODS GOLF CLUB	SOUHEGAN WOODS GOLF CLUB	160.64	7.60	20523-S01	252	255	837	768	504	321	49	115	66	197	310	618
START OF DESIGNATED REACH	START OF DESIGNATED REACH	219.72	0.00		344	348	1144	1050	690	439	67	158	91	269	425	845

<b>2003 Souhegan Estimated Monthly General Standard at Each Impact Point in CFS</b>				General Standard in cfsm													
					0.04	0.04	0.16	0.16	0.04	0.04	0.0038	0.02	0.0038	0.04	0.04	0.04	
USERNAME	FACILITY	DA on DR (SQ MILE)	DR MILE	SD_ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
END OF DESIGNATED REACH	END OF DESIGNATED REACH	21.07	33.22		0.843	0.843	3.371	3.371	0.843	0.843	0.080	0.421	0.080	0.843	0.843	0.843	0.843
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-S01	0.906	0.906	3.624	3.624	0.906	0.906	0.086	0.453	0.086	0.906	0.906	0.906	0.906
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-D01	0.906	0.906	3.624	3.624	0.906	0.906	0.086	0.453	0.086	0.906	0.906	0.906	0.906
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-S01	1.178	1.178	4.714	4.714	1.178	1.178	0.112	0.589	0.112	1.178	1.178	1.178	1.178
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-D01	1.178	1.178	4.714	4.714	1.178	1.178	0.112	0.589	0.112	1.178	1.178	1.178	1.178
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-S01	1.186	1.186	4.743	4.743	1.186	1.186	0.113	0.593	0.113	1.186	1.186	1.186	1.186
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-D01	1.186	1.186	4.743	4.743	1.186	1.186	0.113	0.593	0.113	1.186	1.186	1.186	1.186
GREENVILLE WWTF	GREENVILLE WWTF	30.97	28.16	20086-D01	1.239	1.239	4.955	4.955	1.239	1.239	0.118	0.619	0.118	1.239	1.239	1.239	1.239
PILGRIM FOOD	PILGRIM FOOD	31.51	28.04	20681-S04	1.260	1.260	5.041	5.041	1.260	1.260	0.120	0.630	0.120	1.260	1.260	1.260	1.260
PILGRIM FOOD	PILGRIM FOOD	31.55	27.90	20681-S03	1.262	1.262	5.048	5.048	1.262	1.262	0.120	0.631	0.120	1.262	1.262	1.262	1.262
PILGRIM FOOD	PILGRIM FOOD	31.64	27.61	20681-S02	1.265	1.265	5.062	5.062	1.265	1.265	0.120	0.633	0.120	1.265	1.265	1.265	1.265
GREENVILLE TOWN	GREENVILLE WATER WORKS	38.84	27.38	20047-S03	1.553	1.553	6.214	6.214	1.553	1.553	0.148	0.777	0.148	1.553	1.553	1.553	1.553
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S02	1.870	1.870	7.481	7.481	1.870	1.870	0.178	0.935	0.178	1.870	1.870	1.870	1.870
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S01	1.870	1.870	7.481	7.481	1.870	1.870	0.178	0.935	0.178	1.870	1.870	1.870	1.870
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	63.75	24.04	20621-S02	2.550	2.550	10.200	10.200	2.550	2.550	0.242	1.275	0.242	2.550	2.550	2.550	2.550
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	64.06	23.77	20621-S01	2.562	2.562	10.249	10.249	2.562	2.562	0.243	1.281	0.243	2.562	2.562	2.562	2.562
PIKE INDUSTRIES INC	WILTON QUARRY	99.47	21.48	20281-S01	3.979	3.979	15.914	15.914	3.979	3.979	0.378	1.989	0.378	3.979	3.979	3.979	3.979
NH FISH & GAME	MILFORD FISH HATCHERY	104.18	17.90	20218-S01	4.167	4.167	16.669	16.669	4.167	4.167	0.396	2.084	0.396	4.167	4.167	4.167	4.167
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-S02	4.694	4.694	18.777	18.777	4.694	4.694	0.446	2.347	0.446	4.694	4.694	4.694	4.694
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-D01	4.694	4.694	18.777	18.777	4.694	4.694	0.446	2.347	0.446	4.694	4.694	4.694	4.694
MILFORD WATER WORKS	MILFORD WATER WORKS	139.01	13.66	20100-S01	5.560	5.560	22.242	22.242	5.560	5.560	0.528	2.780	0.528	5.560	5.560	5.560	5.560
MILFORD WWTF	MILFORD WWTF	139.97	13.04	20092-D01	5.599	5.599	22.395	22.395	5.599	5.599	0.532	2.799	0.532	5.599	5.599	5.599	5.599
PONEMAH GREEN GOLF COURSE	PONEMAH GREEN GOLF COURSE	141.69	11.97	20624-S01	5.668	5.668	22.670	22.670	5.668	5.668	0.539	2.834	0.539	5.668	5.668	5.668	5.668
AMHERST COUNTRY CLUB	AMHERST COUNTRY CLUB	141.69	11.97	20190-S01	5.668	5.668	22.670	22.670	5.668	5.668	0.539	2.834	0.539	5.668	5.668	5.668	5.668
PENNICHUCK WATER WORKS	AMHERST VILLAGE DISTRICT	155.19	11.55	20000-S01	6.208	6.208	24.830	24.830	6.208	6.208	0.590	3.104	0.590	6.208	6.208	6.208	6.208
PETER DE BRUYN KOPS	PETER DE BRUYN KOPS	156.21	10.69	20383-S01	6.248	6.248	24.994	24.994	6.248	6.248	0.594	3.124	0.594	6.248	6.248	6.248	6.248
PENNICHUCK WATER WORKS	SOUHEGAN WOODS	160.55	7.76	20659-S01	6.422	6.422	25.688	25.688	6.422	6.422	0.610	3.211	0.610	6.422	6.422	6.422	6.422
SOUHEGAN WOODS GOLF CLUB	SOUHEGAN WOODS GOLF CLUB	160.64	7.60	20523-S01	6.425	6.425	25.702	25.702	6.425	6.425	0.611	3.213	0.611	6.425	6.425	6.425	6.425
START OF DESIGNATED REACH	START OF DESIGNATED REACH	219.72	0.00		8.789	8.789	35.155	35.155	8.789	8.789	0.835	4.394	0.835	8.789	8.789	8.789	8.789

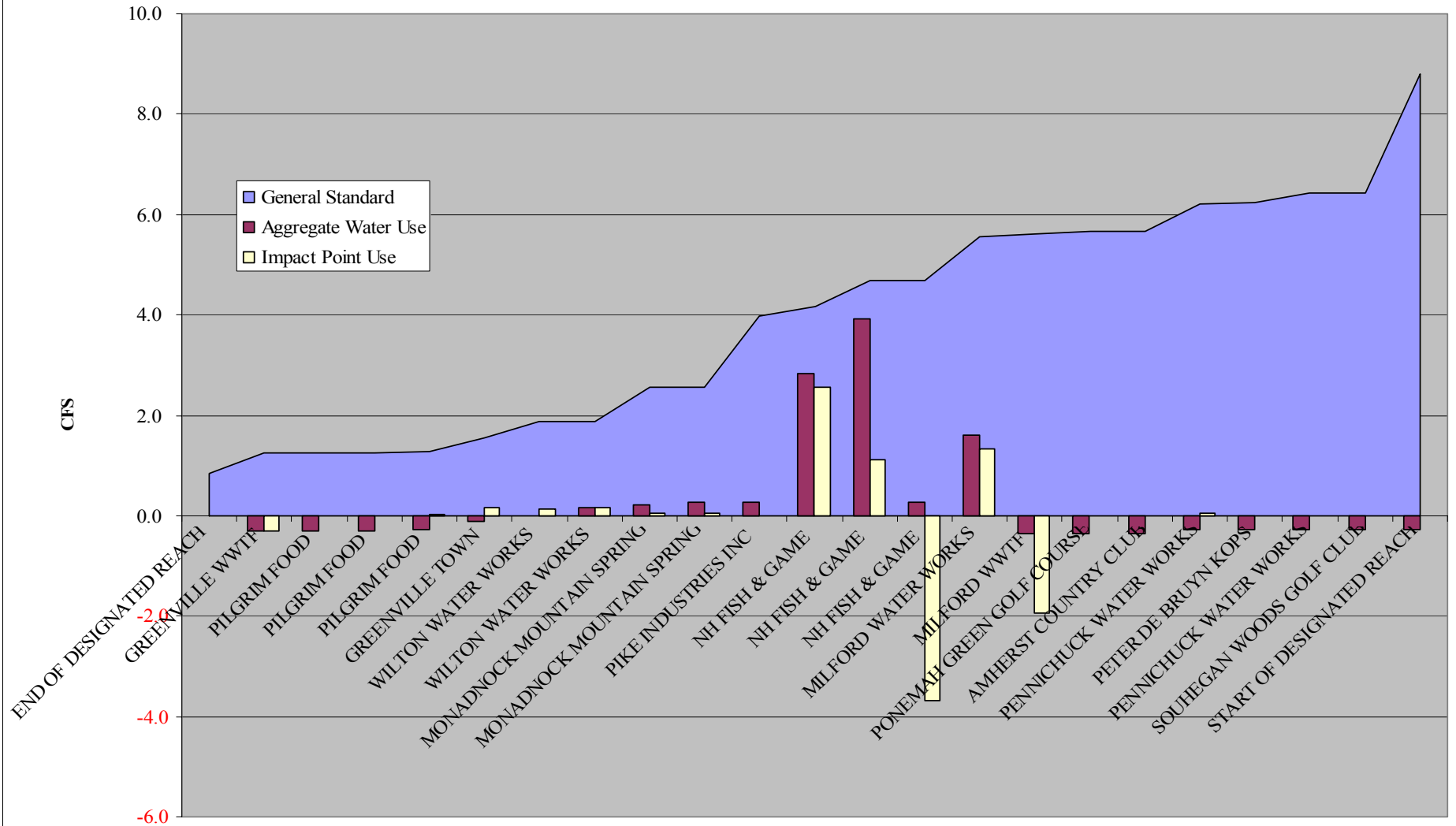
2003 Souhegan Estimated Monthly Margin of the Aggregate Water Use Below the General Standard																	
USERNAME	FACILITY	DA on DR (SQ MILE)	DR MILE	SD_ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
END OF DESIGNATED REACH	END OF DESIGNATED REACH	21.07	33.22		0.84	0.84	3.37	3.37	0.84	0.84	0.08	0.42	0.08	0.84	0.84	0.84	
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-S01	(20.83)	(23.16)	(18.11)	(18.83)	(20.83)	(21.55)	(21.65)	(21.28)	(22.37)	(20.83)	(21.55)	(20.83)	
GREENWOOD ALDEN T	WATER LOOM FALLS HYDRO	22.65	31.38	20228-D01	0.91	0.91	3.62	3.62	0.91	0.91	0.09	0.45	0.09	0.91	0.91	0.91	
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-S01	(23.78)	(26.45)	(20.24)	(21.07)	(23.78)	(24.61)	(24.84)	(24.37)	(25.68)	(23.78)	(24.61)	(23.78)	
GREENWOOD ALDEN T	OTIS FALLS	29.46	28.84	20229-D01	1.18	1.18	4.71	4.71	1.18	1.18	0.11	0.59	0.11	1.18	1.18	1.18	
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-S01	(29.89)	(33.22)	(26.33)	(27.37)	(29.89)	(30.92)	(30.96)	(30.48)	(32.00)	(29.89)	(30.92)	(29.89)	
GREENWOOD ALDEN T	CHAMBERLAIN FALLS HYDRO	29.64	28.69	20230-D01	1.19	1.19	4.74	4.74	1.19	1.19	0.11	0.59	0.11	1.19	1.19	1.19	
GREENVILLE WWTF	GREENVILLE WWTF	30.97	28.16	20086-D01	1.44	1.57	5.34	5.35	1.57	1.57	0.34	0.85	0.33	1.47	1.51	1.54	
PILGRIM FOOD	PILGRIM FOOD	31.51	28.04	20681-S04	1.47	1.59	5.43	5.44	1.59	1.59	0.34	0.86	0.33	1.49	1.53	1.56	
PILGRIM FOOD	PILGRIM FOOD	31.55	27.90	20681-S03	1.47	1.59	5.43	5.44	1.59	1.59	0.34	0.86	0.33	1.49	1.53	1.56	
PILGRIM FOOD	PILGRIM FOOD	31.64	27.61	20681-S02	1.46	1.58	5.42	5.43	1.58	1.57	0.32	0.84	0.30	1.48	1.51	1.55	
GREENVILLE TOWN	GREENVILLE WATER WORKS	38.84	27.38	20047-S03	1.58	1.69	6.40	6.41	1.68	1.65	0.13	0.78	0.14	1.55	1.63	1.67	
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S02	1.77	1.89	7.54	7.55	1.86	1.80	0.01	0.78	0.04	1.74	1.82	1.86	
WILTON WATER WORKS	WILTON WATER WORKS	46.76	24.49	20065-S01	1.64	1.76	7.41	7.44	1.71	1.65	(0.22)	0.64	(0.10)	1.61	1.70	1.70	
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	63.75	24.04	20621-S02	2.27	2.39	10.08	10.11	2.34	2.28	(0.20)	0.93	(0.08)	2.24	2.34	2.34	
MONADNOCK MOUNTAIN SPRING	MONADNOCK MOUNTAIN WATER	64.06	23.77	20621-S01	2.24	2.35	10.08	10.11	2.31	2.24	(0.25)	0.88	(0.13)	2.21	2.30	2.30	
PIKE INDUSTRIES INC	WILTON QUARRY	99.47	21.48	20281-S01	3.65	3.76	15.75	15.73	3.67	3.59	(0.25)	1.50	(0.11)	3.59	3.68	3.72	
NH FISH & GAME	MILFORD FISH HATCHERY	104.18	17.90	20218-S01	1.28	1.39	13.94	13.92	1.30	1.22	(2.79)	(0.96)	(2.65)	1.21	1.30	1.35	
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-S02	0.58	0.69	14.82	14.86	0.66	1.12	(3.97)	(1.93)	(3.83)	0.63	0.72	0.76	
NH FISH & GAME	MILFORD FISH HATCHERY	117.36	17.48	20218-D01	4.37	4.48	18.61	18.59	4.39	4.31	(0.18)	1.86	(0.04)	4.30	4.39	4.44	
MILFORD WATER WORKS	MILFORD WATER WORKS	139.01	13.66	20100-S01	3.77	3.89	20.68	20.60	3.73	3.57	(1.69)	0.64	(1.52)	3.79	3.93	3.96	
MILFORD WWTF	MILFORD WWTF	139.97	13.04	20092-D01	5.81	5.89	24.06	23.96	6.42	5.97	(0.07)	2.37	0.06	5.52	5.93	5.95	
PONEMAH GREEN GOLF COURSE	PONEMAH GREEN GOLF COURSE	141.69	11.97	20624-S01	5.88	5.95	24.34	24.24	6.48	6.01	(0.15)	2.35	0.05	5.59	6.00	6.01	
AMHERST COUNTRY CLUB	AMHERST COUNTRY CLUB	141.69	11.97	20190-S01	5.88	5.95	24.34	24.24	6.43	5.85	(0.62)	2.06	(0.05)	5.57	6.00	6.01	
PENNICHUCK WATER WORKS	AMHERST VILLAGE DISTRICT	155.19	11.55	20000-S01	6.36	6.46	26.45	26.27	6.82	6.19	(0.79)	2.22	(0.09)	6.04	6.49	6.49	
PETER DE BRUYN KOPS	PETER DE BRUYN KOPS	156.21	10.69	20383-S01	6.41	6.51	26.61	26.43	6.86	6.23	(0.79)	2.24	(0.09)	6.08	6.53	6.53	
PENNICHUCK WATER WORKS	SOUHEGAN WOODS	160.55	7.76	20659-S01	6.54	6.65	27.27	27.08	7.00	6.32	(0.89)	2.23	(0.16)	6.24	6.70	6.70	
SOUHEGAN WOODS GOLF CLUB	SOUHEGAN WOODS GOLF CLUB	160.64	7.60	20523-S01	6.55	6.65	27.29	27.10	6.92	6.24	(1.23)	2.03	(0.28)	6.21	6.70	6.70	
START OF DESIGNATED REACH	START OF DESIGNATED REACH	219.72	0.00		8.91	9.01	36.74	36.55	9.28	8.60	(1.01)	3.21	(0.06)	8.58	9.06	9.07	

## 7. Monthly Aggregate Water Use versus Stream Flow Graphs

**January 2003 Souhegan**



## December 2003 Souhegan



## Lamprey Annual Water Use versus Stream Flow – Calendar Year 2003

The Lamprey Water Management Planning Area covers 212 square miles and includes a streamflow gage in Durham (USGS 01073500 LAMPREY RIVER NEAR NEWMARKET, NH) measuring 183 square miles of the WMPA. For this report, the streamflow was transposed areal from the gage to all impact points on the Designated River. There are 15 registered sources and one registered, measured discharge in the Water Management Planning Area.

The entire Lamprey Designated Reach was not in compliance with the General Standard in 2003 for the months of July, August and September. Water use in the Water Management Planning Area is predominately for municipal, community or institutional water supplies including Raymond Water Works, Epping Water Works, Newmarket Water Works, University of NH Water Works (Durham). Green Hills Community Water Supply transfers water from the Raymond water system. Some of these sources were not active in 2003. There is some use by a nursery and a lumber company beginning in April and continuing until October. Peak use by these facilities is in June, July and August. Registered, measured returns are limited to the Epping Waste Water Treatment Facility.



# Lamprey River Affected Water User Facilities: Source and Discharge Locations

## Legend

### Affected Water Users

- Source
- Discharge

- Stream Gages
- ▲ Active
- △ Inactive

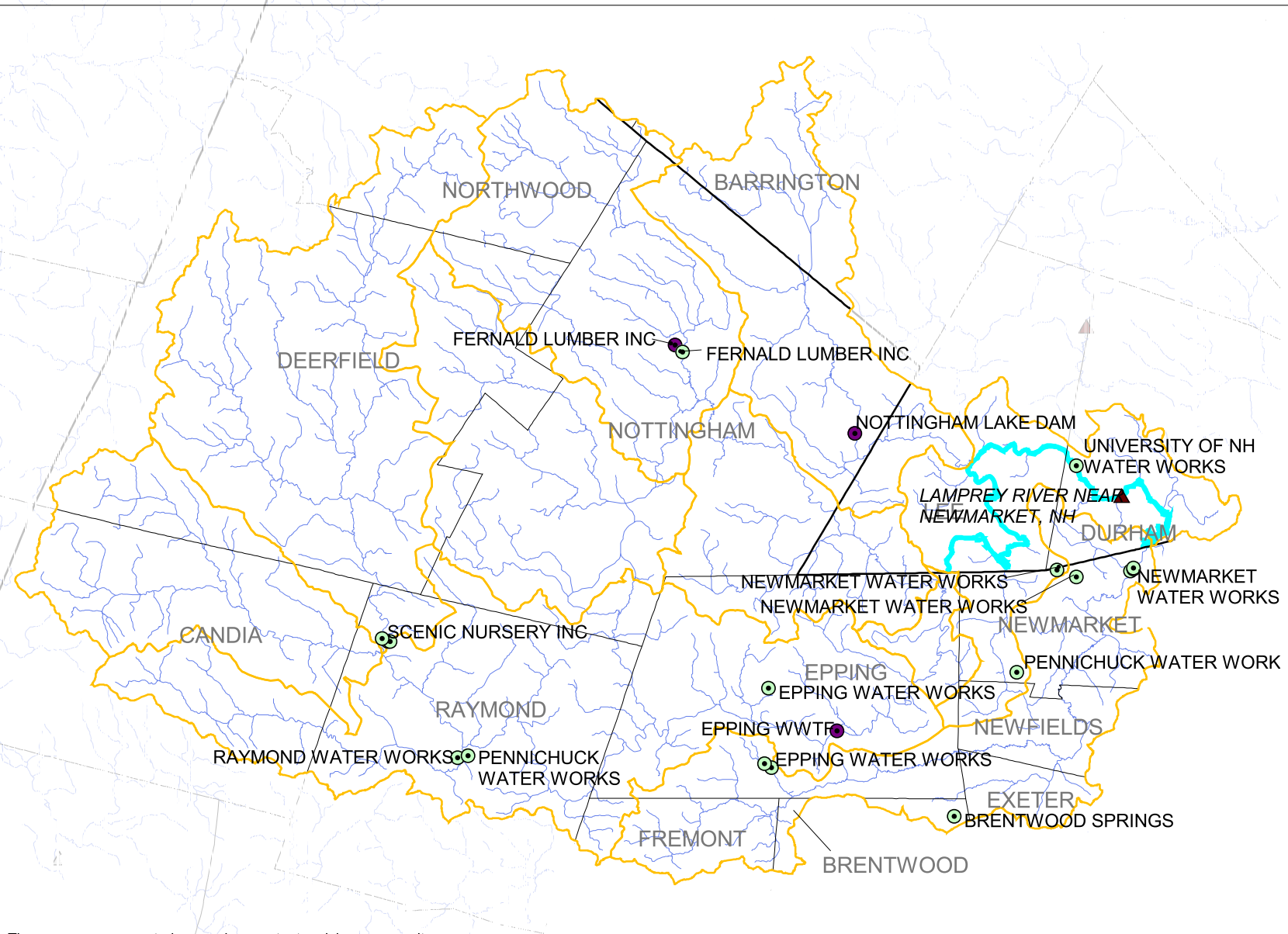
Designated Reach

Hydrology

State boundary

Town boundary

WMPA



The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced January 22, 2004

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0 1 2 Miles

2003 Lamprey Water Use in CFS															
USERNAME	FACILITY	DA on DR (SQ MILE)	WUSD_ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SCENIC NURSERY INC		172.95	20747 20747-S03	0.000	0.000	0.000	0.000	0.000	0.012	0.012	0.012	0.000	0.000	0.000	0.000
SCENIC NURSERY INC		172.95	20747 20747-S02	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000
SCENIC NURSERY INC		172.95	20747 20747-S01	0.000	0.000	0.000	0.001	0.001	0.005	0.006	0.006	0.004	0.001	0.000	0.000
FERNALD LUMBER INC	SAWMILL	172.95	20557 20557-S01	0.000	0.000	0.000	0.000	0.023	0.023	0.023	0.023	0.023	0.017	0.000	0.000
FERNALD LUMBER INC	SAWMILL	172.95	20557 20557-D01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EPPING WWTF	WASTE WATER TREAT PLANT	172.95	20389 20389-D01	(0.227)	(0.262)	(0.289)	(0.604)	(0.627)	(0.398)	(0.259)	(0.255)	(0.181)	(0.184)	(0.297)	(0.373)
RAYMOND WATER DEPARTMENT	WATER WORKS	172.95	20061 20061-S01	0.449	0.470	0.517	0.455	0.454	0.510	0.583	0.499	0.439	0.433	0.413	0.397
PENNICHUCK WATER WORKS	GREEN HILLS COMM WS	172.95	20351 20061-S01	0.121	0.121	0.121	0.068	0.068	0.068	0.778	0.778	0.804	0.000	0.000	0.000
EPPING WATER WORKS	EPPING WATER WORKS	172.95	20045 20045-S02	0.090	0.081	0.082	0.079	0.085	0.104	0.103	0.079	0.085	0.081	0.087	0.075
End of Designated Reach		172.95													
NEWMARKET WATER WORKS	NEWMARKET WATER WORKS	178.38	20057 20057-S02	0.134	0.009	0.095	0.096	0.101	0.215	0.359	0.335	0.336	0.350	0.266	0.395
UNIVERSITY OF NH	WATER WORKS	183.73	20066 20066-S02	0.000	0.000	0.000	0.000	0.835	0.751	0.886	0.889	0.918	1.072	0.738	0.005
NEWMARKET WATER WORKS	NEWMARKET WATER WORKS	206.25	20057 20057-S05	1.014	1.006	1.079	0.771	1.135	0.426	0.000	0.000	0.000	0.000	0.000	0.000
NEWMARKET WATER WORKS	NEWMARKET WATER WORKS	206.25	20057 20057-S04	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NEWMARKET WATER WORKS	NEWMARKET WATER WORKS	206.25	20057 20057-S03	0.188	0.012	0.133	0.121	0.173	0.302	0.479	0.395	0.402	0.469	0.353	0.301
NEWMARKET WATER WORKS	NEWMARKET WATER WORKS	206.25	20057 20057-S01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EPPING WATER WORKS	EPPING WATER WORKS	206.25	20045 20045-S03	0.059	0.053	0.055	0.051	0.056	0.051	0.062	0.058	0.054	0.052	0.055	0.056
EPPING WATER WORKS	EPPING WATER WORKS	206.25	20045 20045-S01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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#### 4. Table of Estimated Monthly Stream Flows and General Standard Values

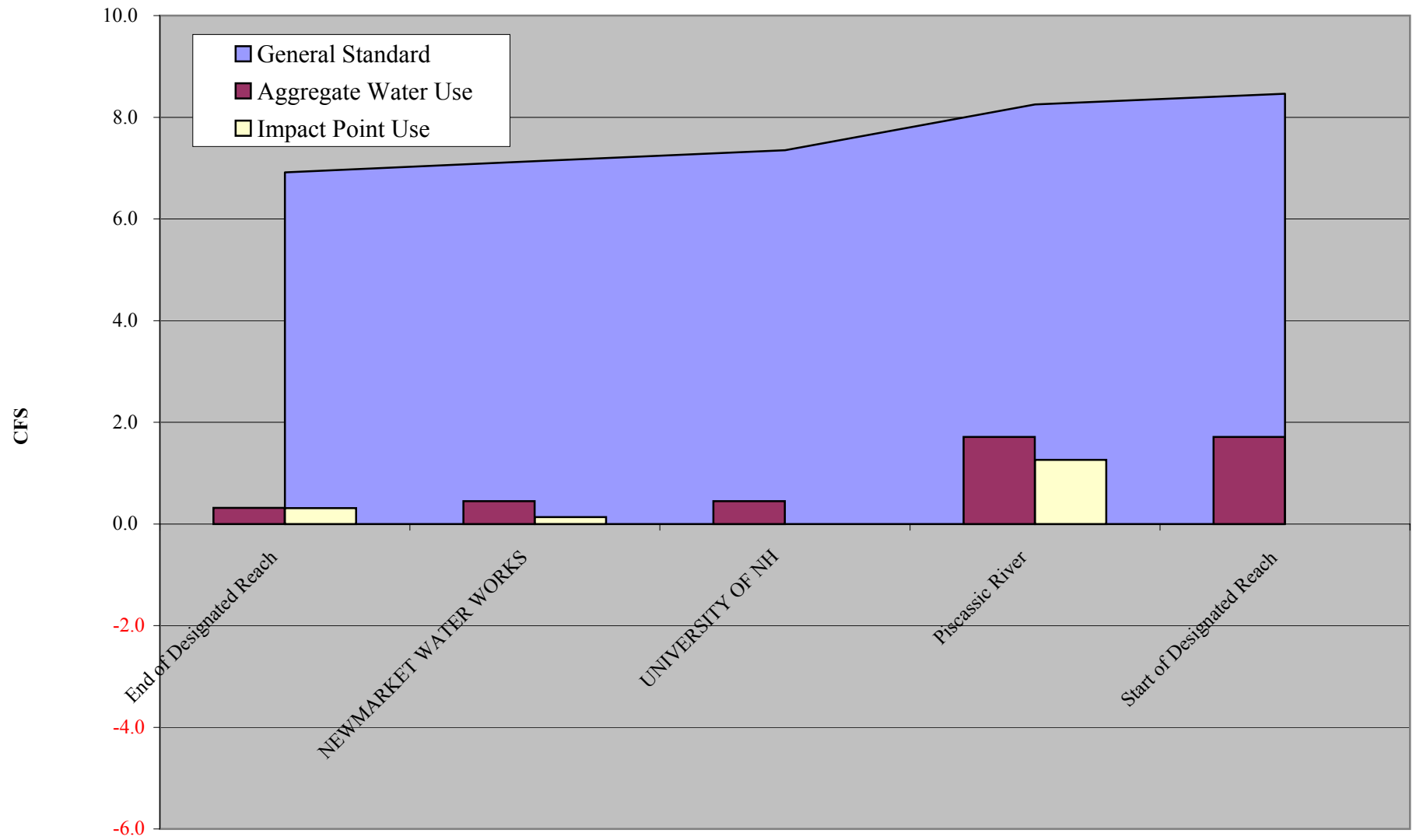
<b>USGS 01073500 LAMPREY RIVER NEAR NEWMARKET, NH</b>						
DA(mi^2)	183					
7Q10 (cfs)	4.8					
	Mean of daily streamflows (2003) in cfs	Mean of monthly streamflows (POR= 68 years) in cfs	Median of monthly means (cfs)	Estimated 2003 monthly mean streamflow in CFSM	General Standard in cfsm	
Jan-03	198	283	261.5	1.08	0.04	
Feb-03	161	305	262	0.88	0.02	
Mar-03	799	608	545.5	4.37	0.16	
Apr-03	712	687	617	3.89	0.04	
May-03	337	348	299	1.84	0.04	
Jun-03	220	192	146	1.20	0.04	
Jul-03	32	92.9	70.5	0.17	0.0013	
Aug-03	80	70.1	45	0.44	0.0013	
Sep-03	53	70	46.4	0.29	0.0013	
Oct-03	206	128	91.3	1.13	0.04	
Nov-03	338	259	196	1.84	0.04	
Dec-03	498	328	272	2.72	0.04	
2003 daily data availability						
98.9%	= number of days with data in 2003 / 365 days					
	Using POR average streamflow for this month					
	Using POR average daily streamflows for part of this month					

[illegible]

2003 Lamprey Estimated Monthly General Standard at Each Impact Point in CFS			General Standard in cfsm												
				0.04	0.02	0.16	0.04	0.04	0.04	0.0013	0.0013	0.0013	0.04	0.04	0.04
USERNAME	FACILITY	DA on DR (SQ MILE)		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
End of Designated Reach		172.95		6.9	3.5	28	6.9	6.9	6.9	0.23	0.23	0.23	6.9	6.9	6.9
NEWMARKET WATER WORKS	NEWMARKET WATER WORKS	178.38	20057 20057-S02	7.1	3.6	29	7.1	7.1	7.1	0.23	0.23	0.23	7.1	7.1	7.1
UNIVERSITY OF NH	WATER WORKS	183.73	20066 20066-S02	7.3	3.7	29	7.3	7.3	7.3	0.24	0.24	0.24	7.3	7.3	7.3
Piscassic River		206.25		8.2	4.1	33	8.2	8.2	8.2	0.27	0.27	0.27	8.2	8.2	8.2
Start of Designated Reach		211.59		8.5	4.2	34	8.5	8.5	8.5	0.28	0.28	0.28	8.5	8.5	8.5

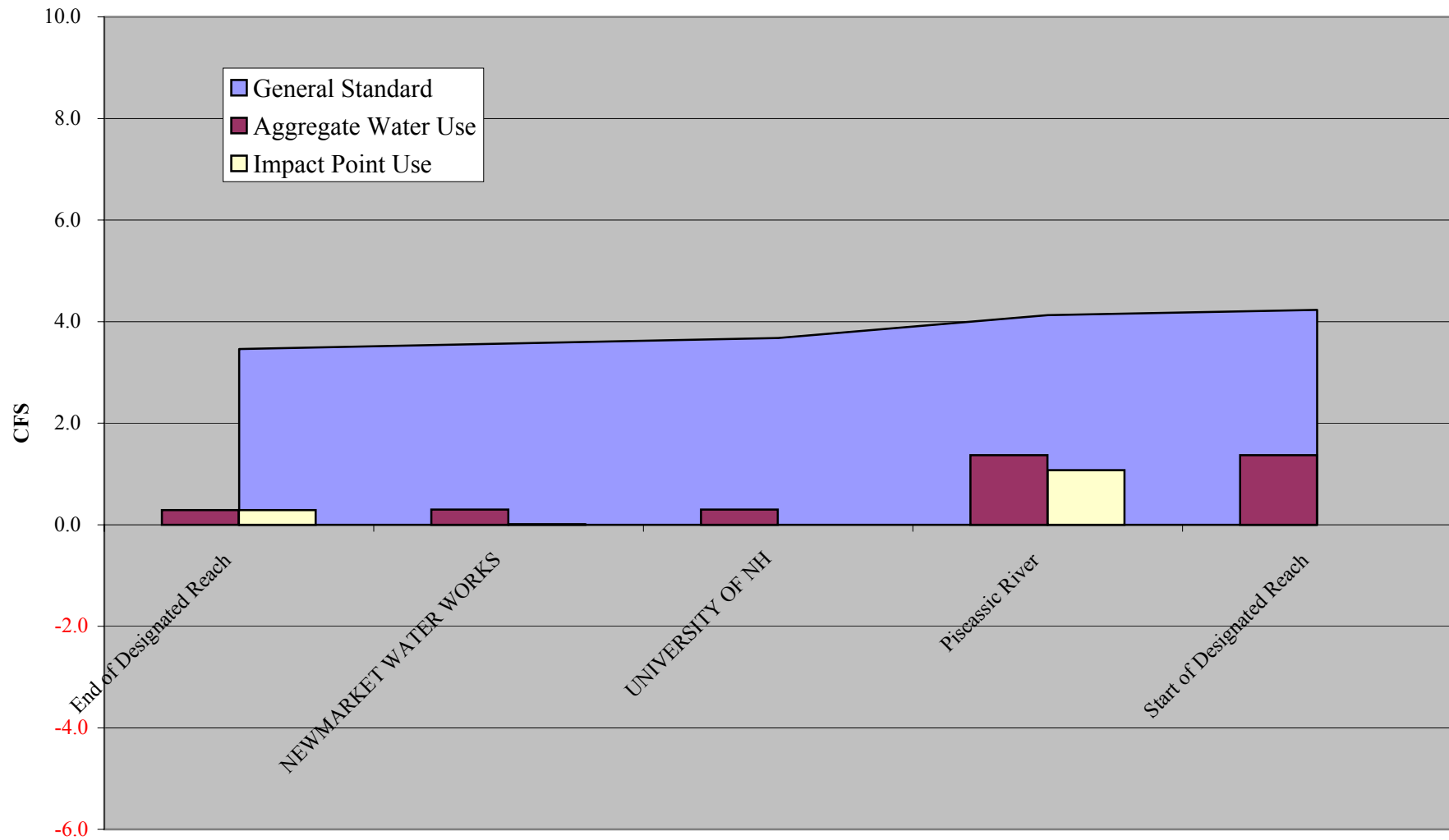
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## January 2003 Lamprey

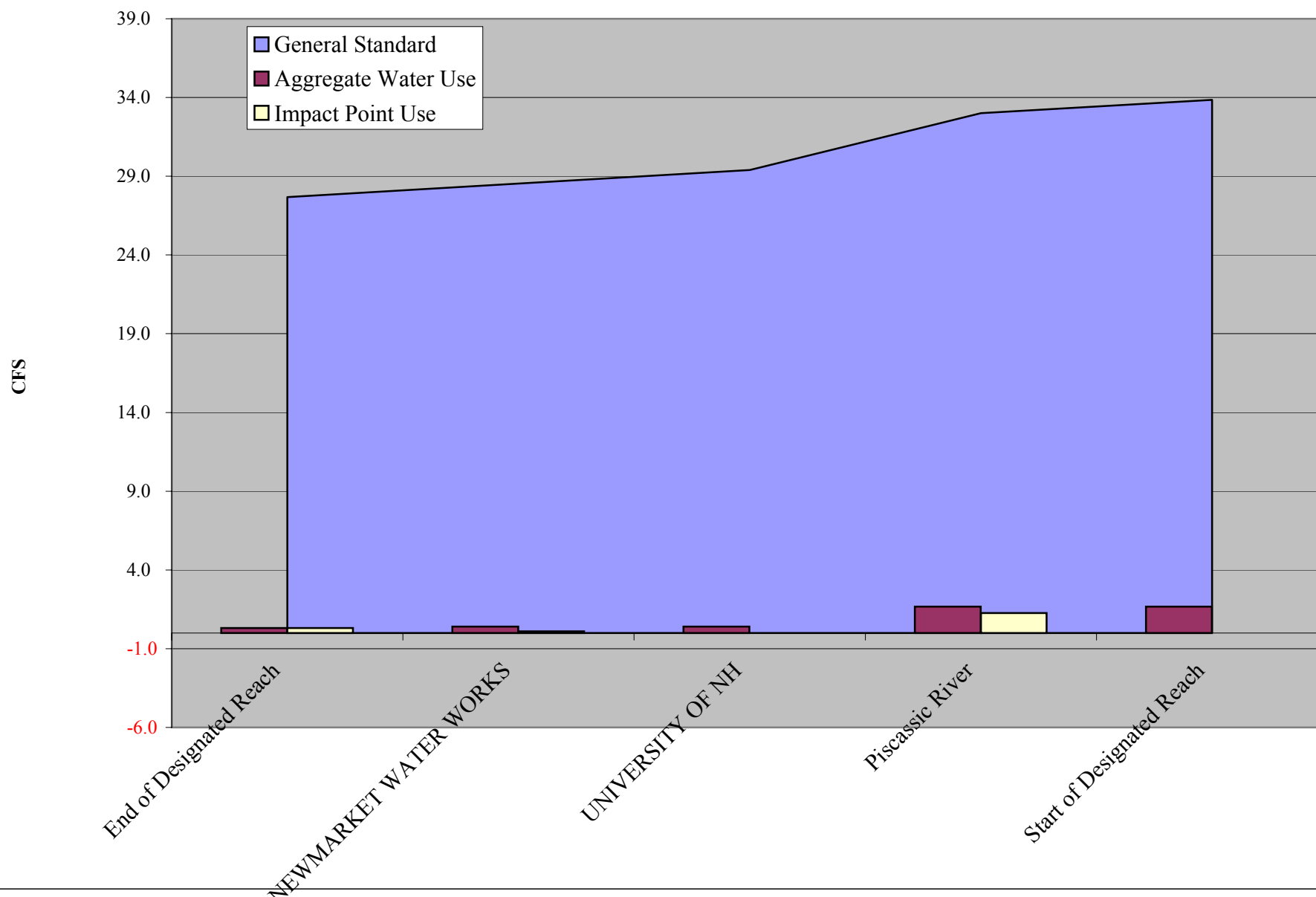




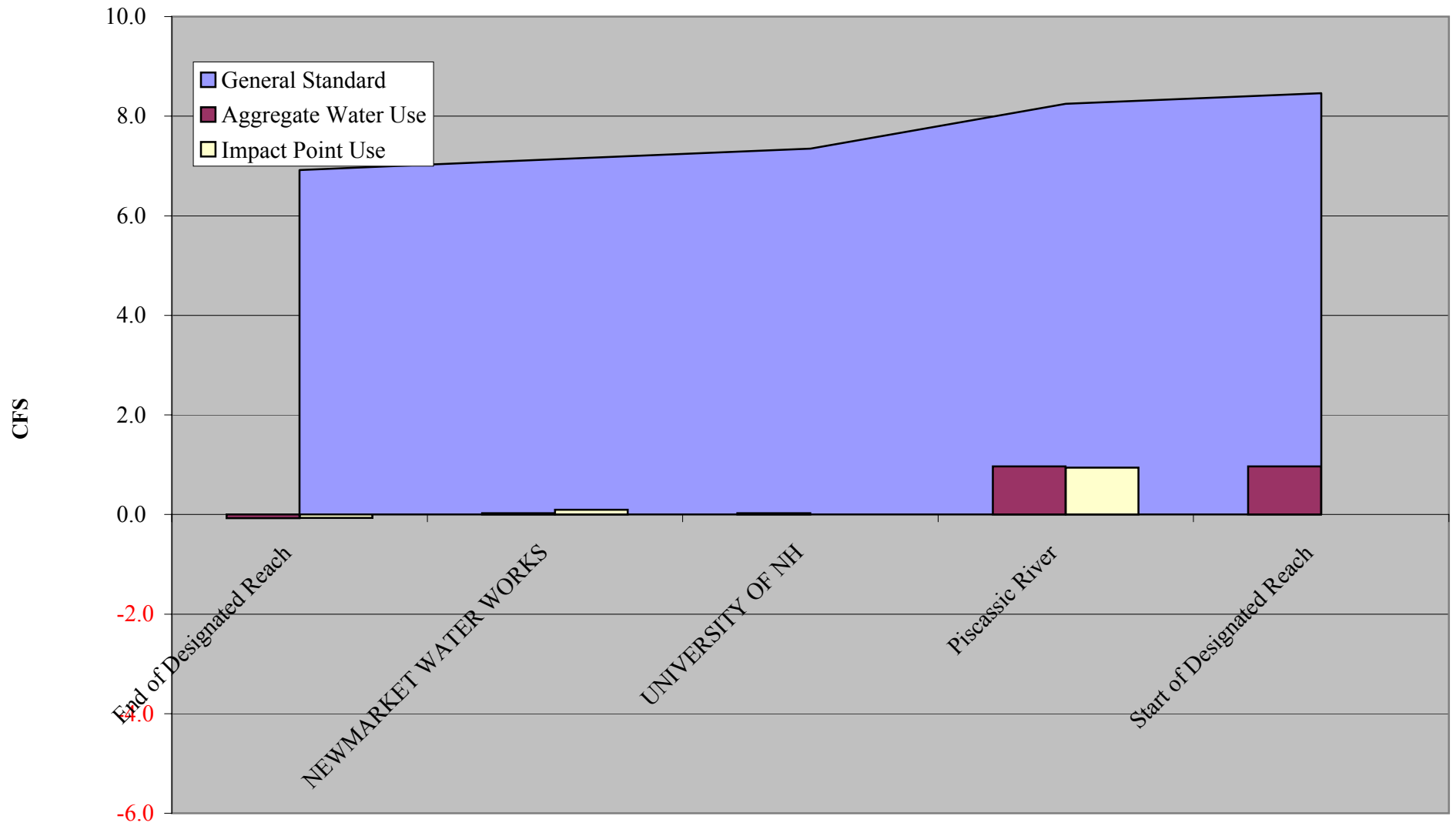
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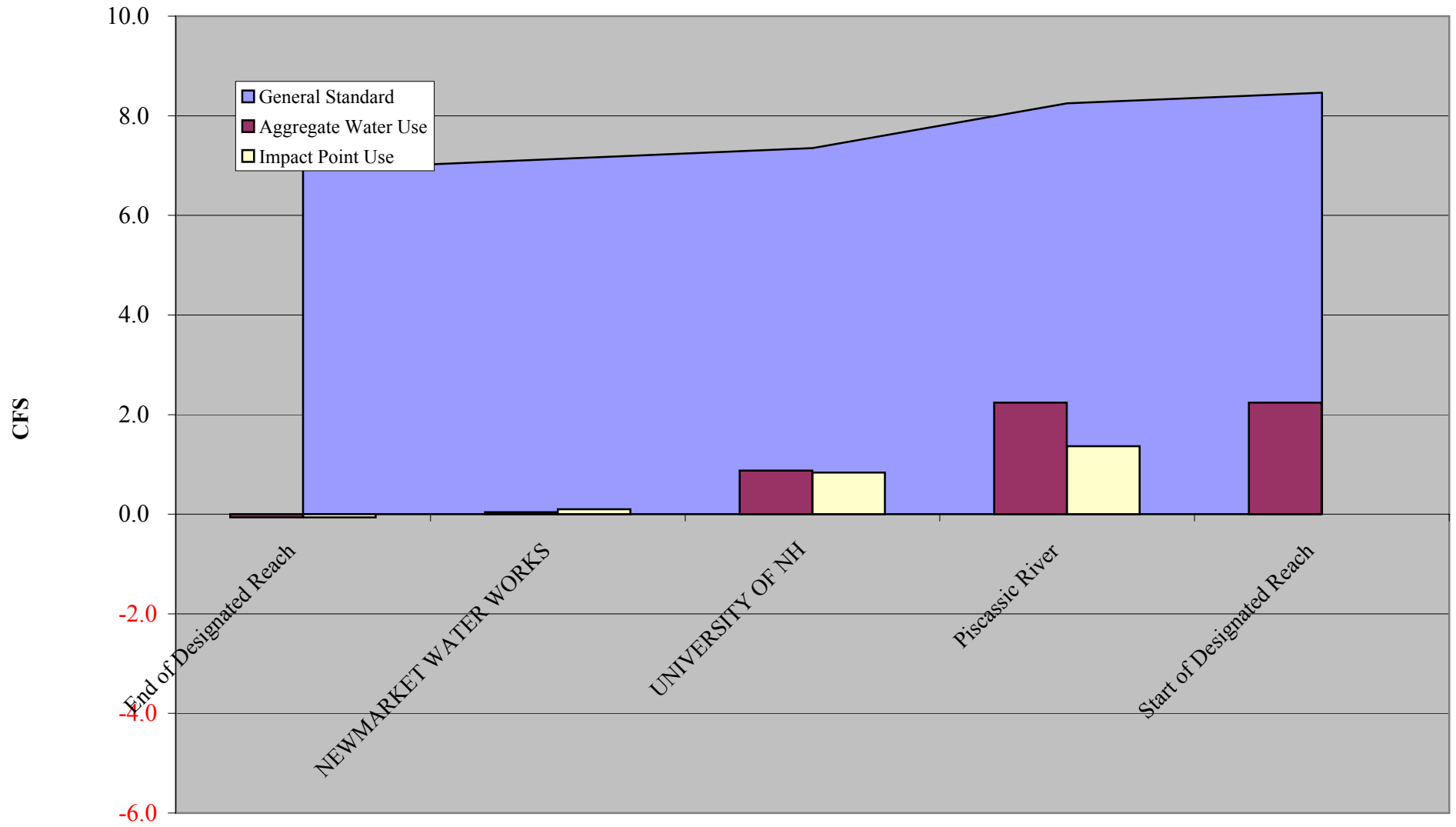
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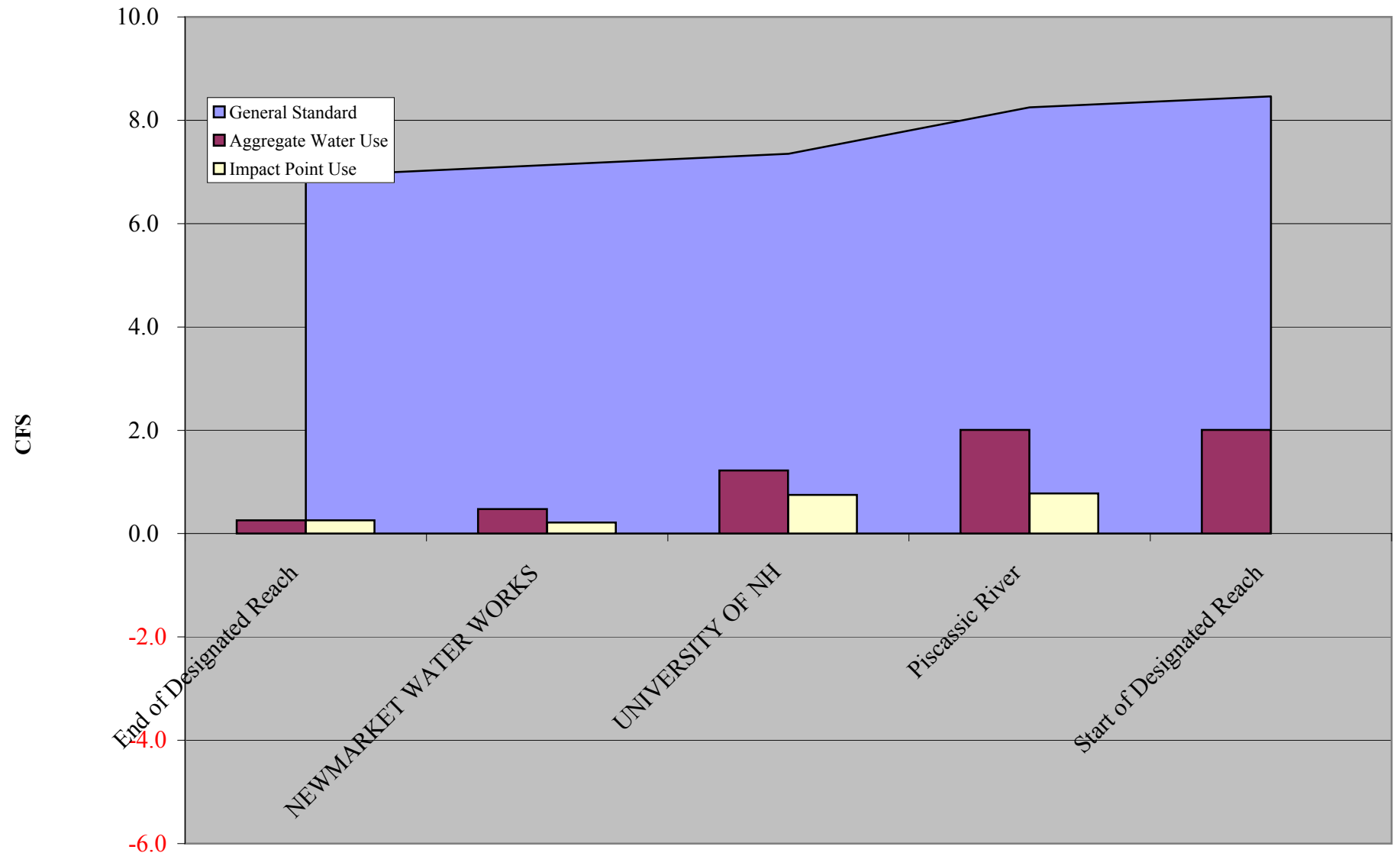
# April 2003 Lamprey



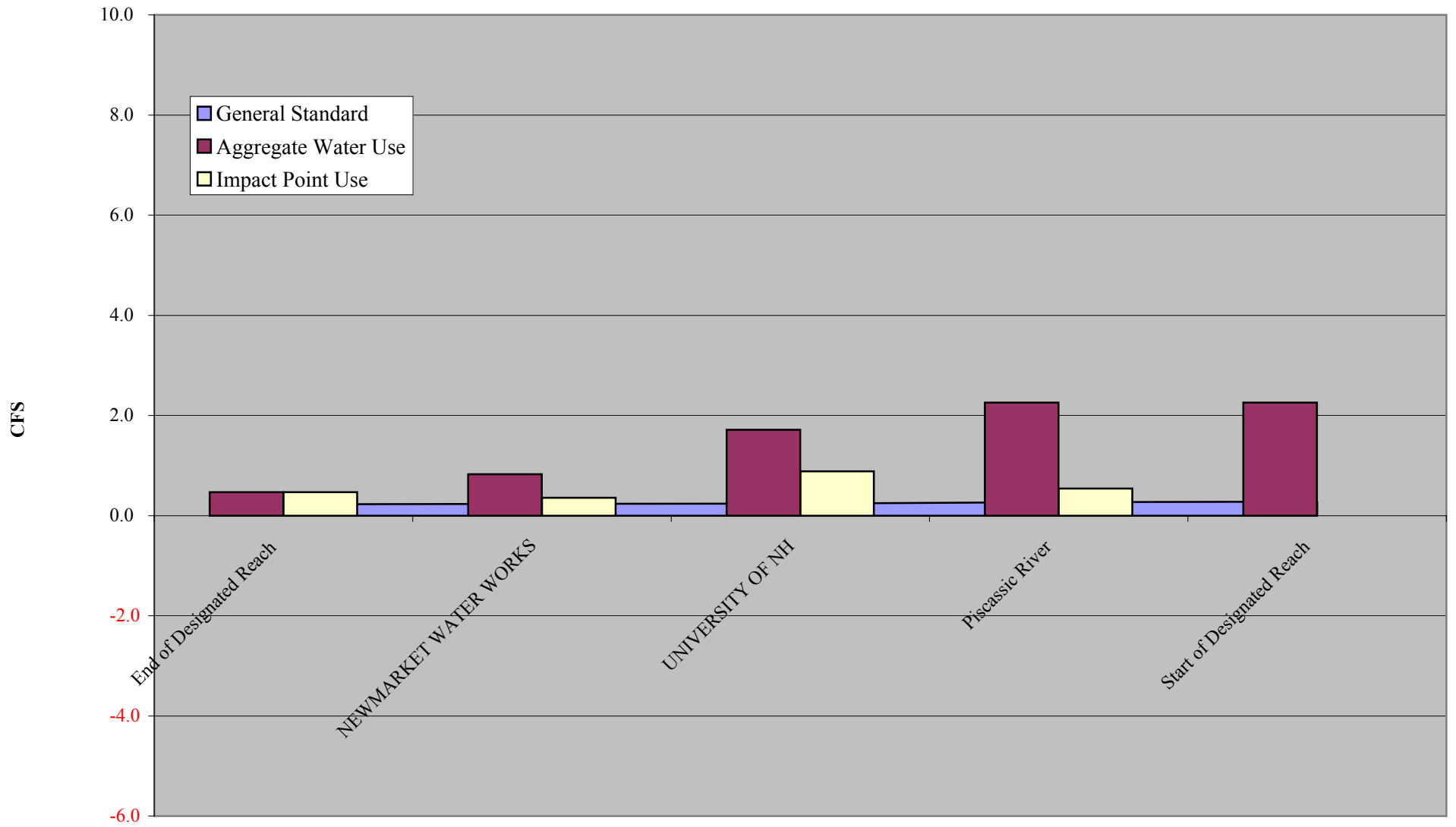
## May 2003 Lamprey



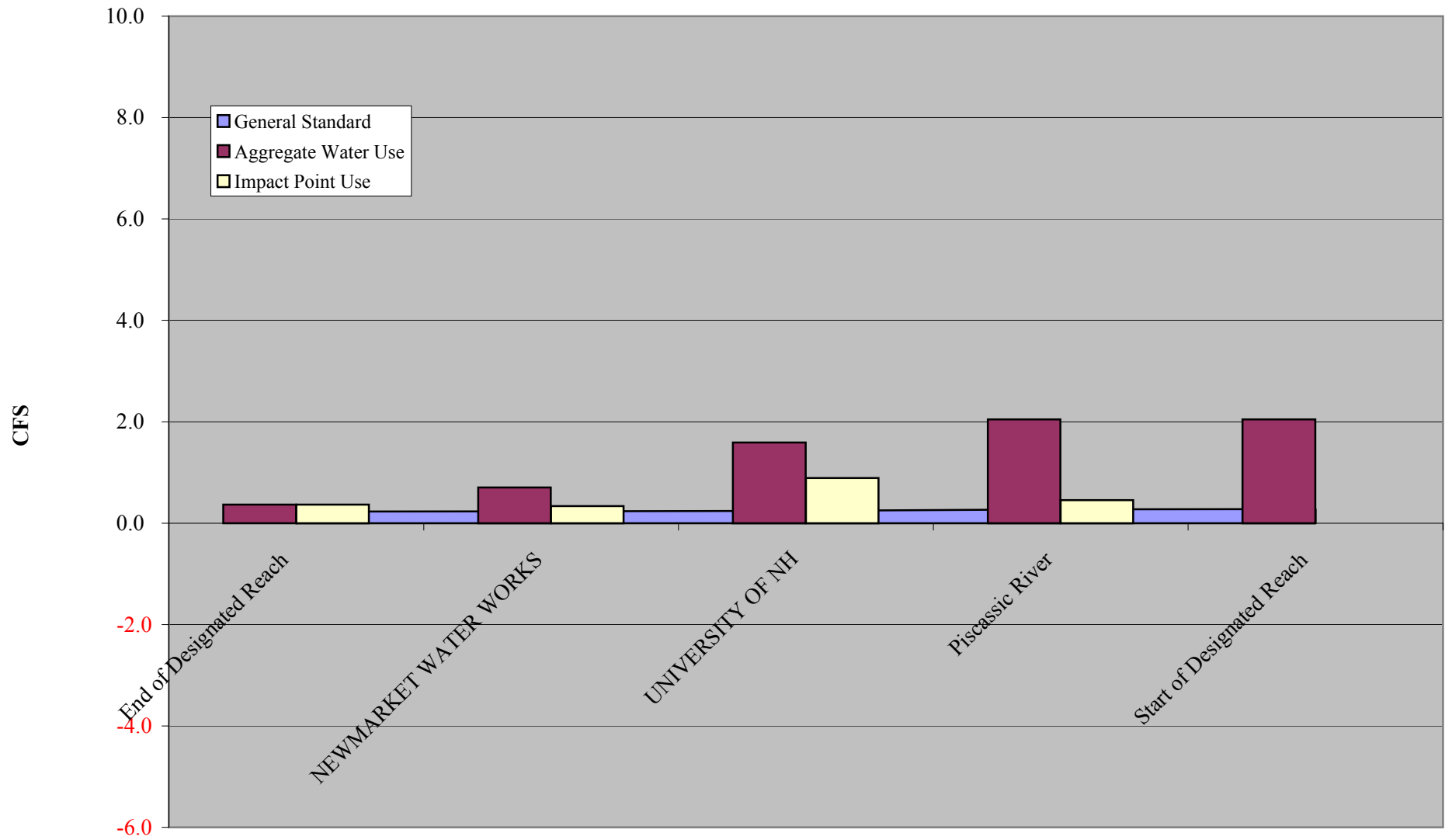
## June 2003 Lamprey



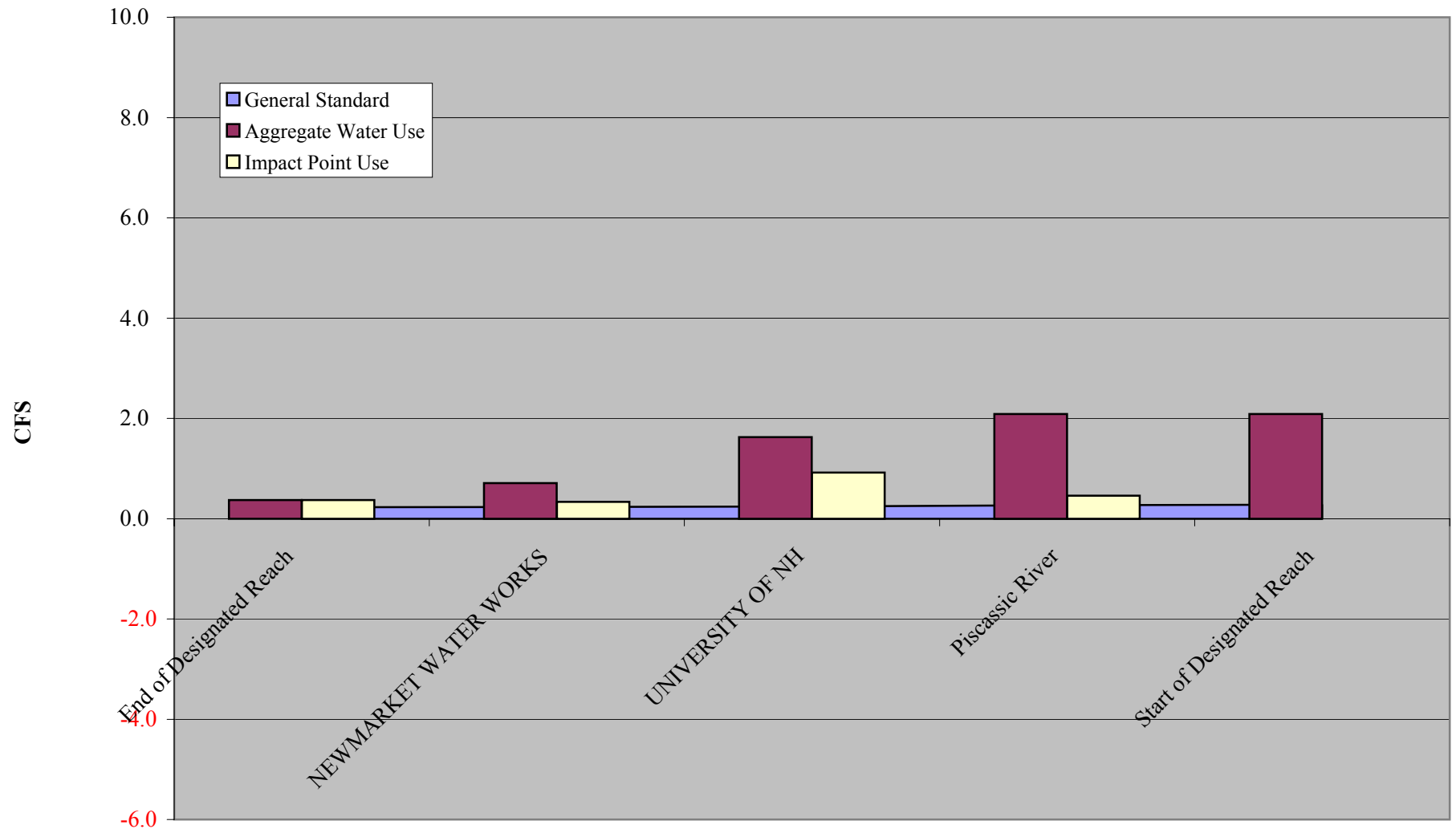
## July 2003 Lamprey



## August 2003 Lamprey

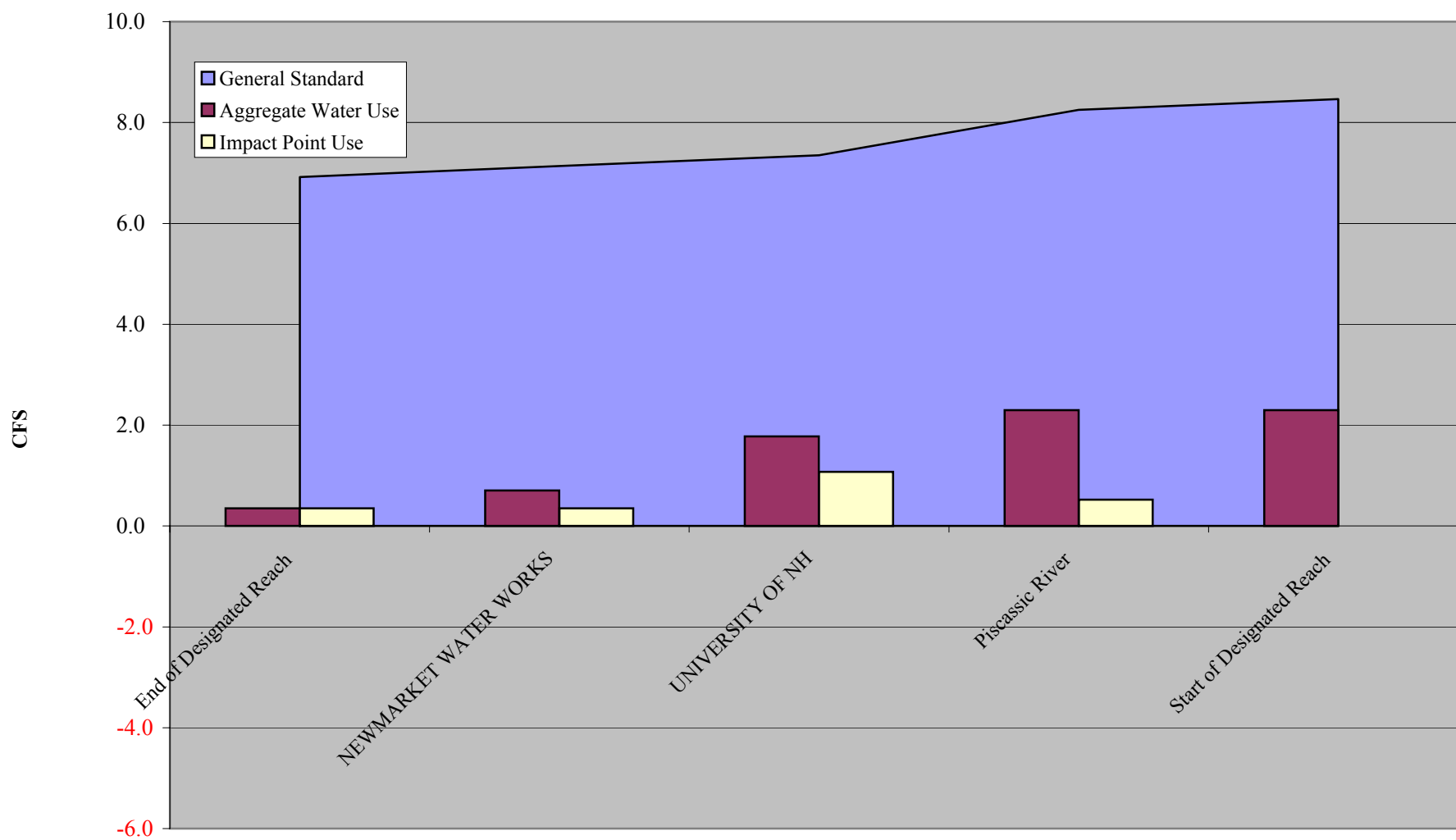


## September 2003 Lamprey

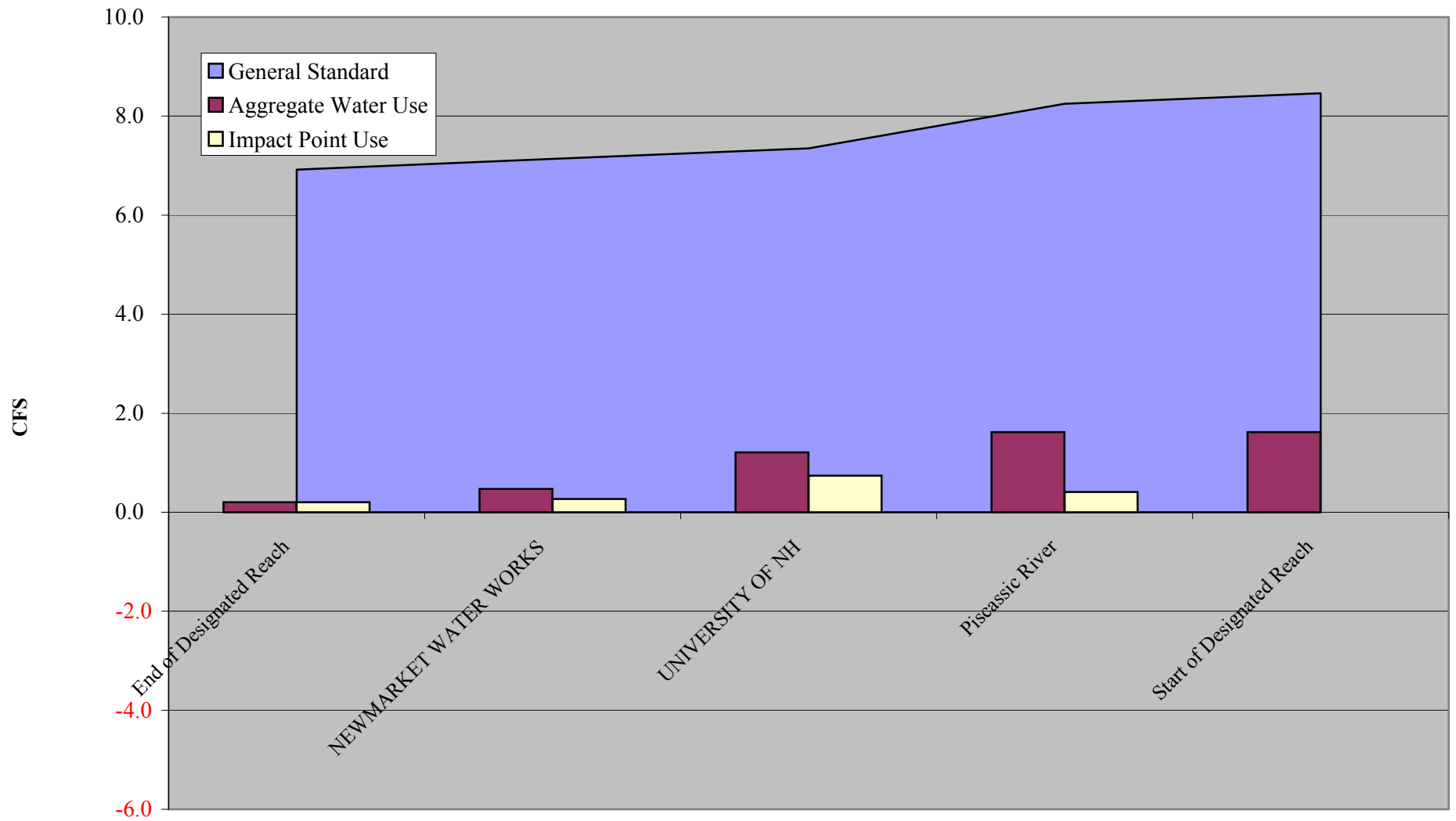




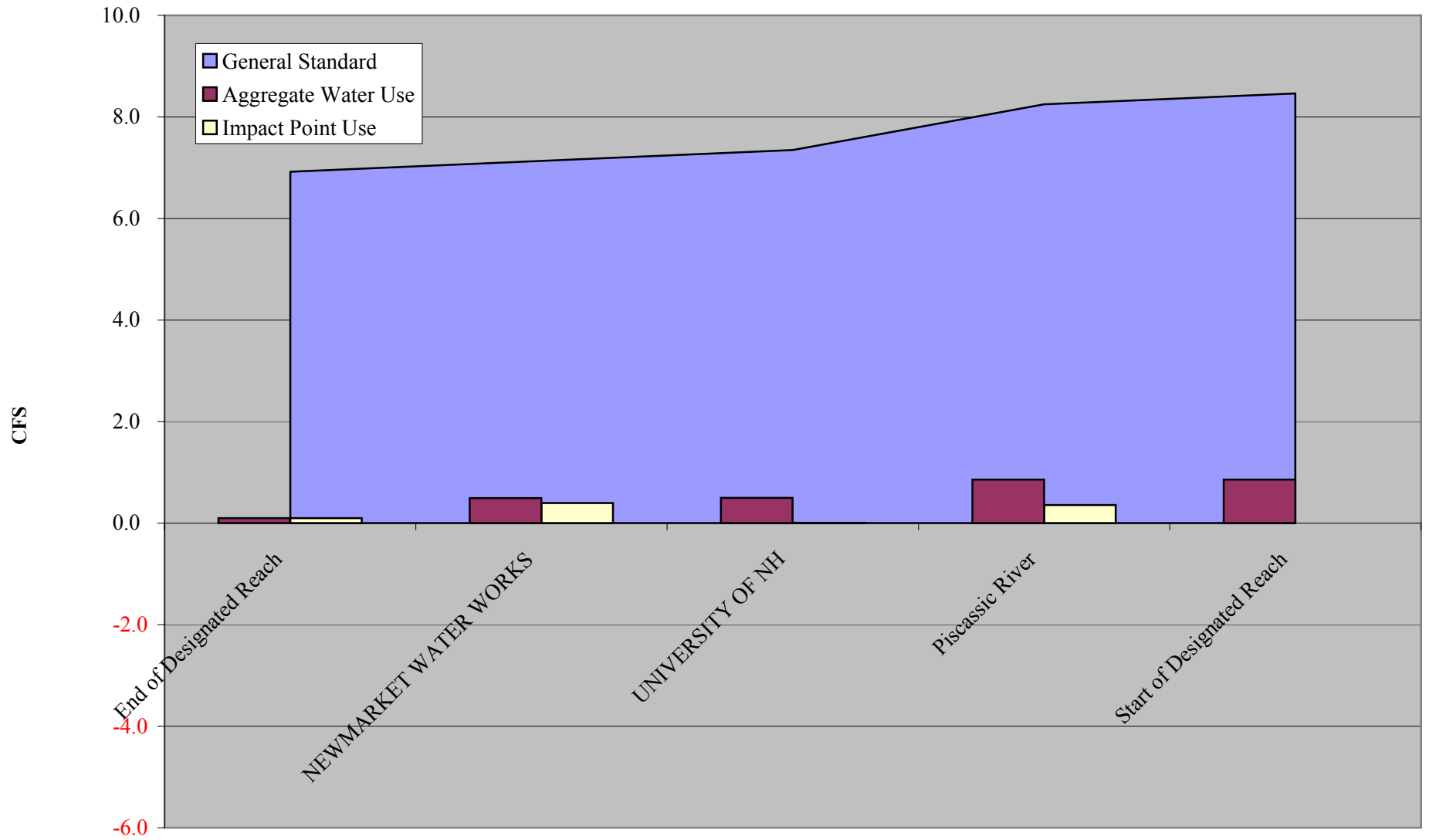
## October 2003 Lamprey



## November 2003 Lamprey



## December 2003 Lamprey



## Ashuelot Annual Water Use versus Stream Flow – Calendar Year 2003

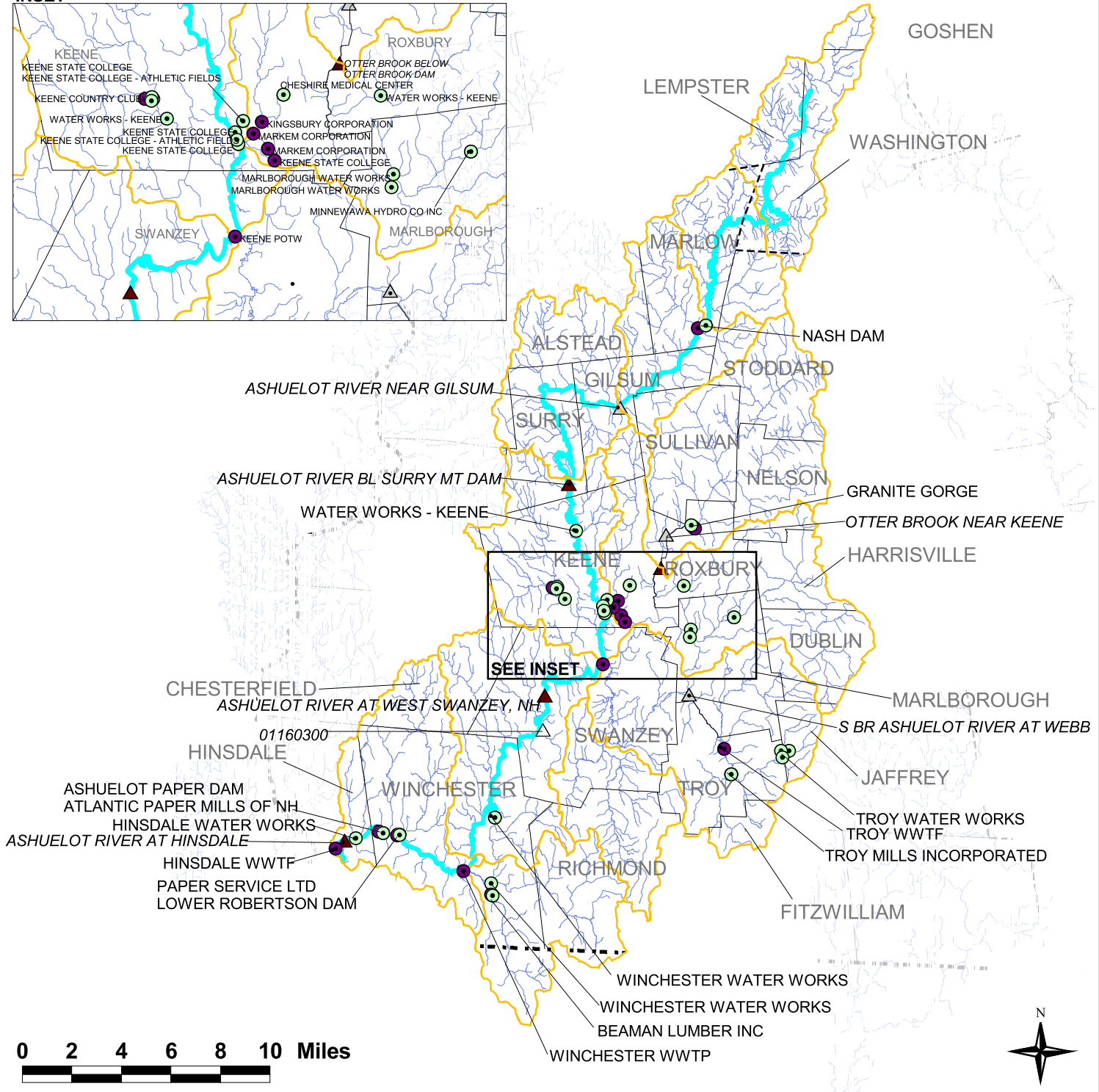
The Ashuelot Water Management Planning Area covers 422 square miles and includes three streamflow gage used this report. The gages are in Surry (**USGS 01158000 ASHUELOT RIVER BELOW SURRY MT DAM, NEAR KEENE, NH**) measuring 101 square miles of the WMPA; in Swanzey (**USGS 01160350 ASHUELOT RIVER AT WEST SWANZEY, NH**) measuring 316.1 square miles; and in Hinsdale (**USGS 01161000 ASHUELOT RIVER AT HINSDALE, NH**) measuring 420 square miles. For this report the streamflow was transposed areal from these gages to all impact points on the Designated River. There are 27 registered sources and 14 registered, measured discharges in the Water Management Planning Area.

July was the only month in 2003 the Designated Rive was not in compliance with the General Standard. In July, the Designated Rive was not in compliance with the General Standard from most upstream source for the Keene Water Works, which is below the Surry Mountain gage, to the beginning of the Designated Reach in Hinsdale

The Water Management Planning Area includes registered water use by four hydroelectric facilities. These facilities are run of the river type water uses. Water use by hydroelectric facilities are not shown in the monthly graphs because flow in is expected to equal flow out and because the General Standard does not apply to hydroelectric facilities between their point of withdrawal and point of return per Env-Ws 1903.02(d). Other water users include Keene State College for athletic fields and institutional uses; municipal water supplies in Keene, Marlborough, Troy, Winchester and Hinsdale; golf course irrigation at Keene Country Club; snowmaking at Granite Gorge; and several industrial uses including among other types paper making and lumber mill operations. Measured, registered returns other than from hydroelectric facilities include industrial returns and returns from four waste water treatment facilities.

# Ashuelot Affected Water User Facilities: Source and Discharge Locations

INSET



## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- Active
- Inactive
- Unknown



Designated Reach



Hydrology



State boundary



Town boundary



WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced January 28, 2004

h:\water quality\instream flow\gisprojects\wmpa\Ashuelot\_waterquality.apr

### 2003 Ashuelot Water Use in CFS

			DA on DR (SQ)													SD_TY
USERNAME	FACILITY	WUSD_ID	(MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	PEI
End of Designated Reach			7.0													
MARLOW POWER	NASH DAM	20246 20246-S01	46.3	28.379	##	16.425	27.088	25.602	30.054	2.636	19.813	12.352	6.353	18.820	20.284	SW
MARLOW POWER	NASH DAM	20246 20246-D01	46.3	(28.379)	##	(16.425)	(27.088)	(25.602)	(30.054)	(2.636)	(19.813)	(12.352)	(6.353)	(18.820)	(20.284)	SW
KEENE PUBLIC WATER DEPT	WATER WORKS - KEENE	20338 20338-S03	108.5	0.359	##	0.424	0.354	0.344	1.466	1.733	1.480	1.559	1.324	1.331	1.318	GW
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S03	115.6	0.000	##	0.000	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.000	0.000	GW
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S02	115.6	0.000	##	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	SW
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S01	115.6	0.000	##	0.000	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.000	0.000	SW
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20338-S04	115.6	0.000	##	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	TW
GRANITE GORGE LLC	GRANITE GORGE	20767 20767-S01	215.8	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	SW
KEENE STATE COLLEGE	KEENE STATE COLLEGE	20494 20338-S01	215.8	0.166	##	0.166	0.217	0.210	0.217	0.090	0.092	0.093	0.247	0.256	0.248	TW
SOUTHERN NH HYDRO	MINNEWAWA HYDRO CO INC	20462 20462-S01	215.8	15.529	##	19.713	33.632	15.174	21.395	1.985	7.233	4.689	16.238	24.839	24.038	SW
SOUTHERN NH HYDRO	MINNEWAWA HYDRO CO INC	20462 20462-D01	215.8	(15.529)	##	(19.713)	(33.632)	(15.174)	(21.395)	(1.985)	(7.233)	(4.689)	(16.238)	(24.839)	(24.038)	SW
MARKEM CORPORATION	MARKEM CORPORATION	20406 20406-D03	215.8	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	SW
MARKEM CORPORATION	MARKEM CORPORATION	20406 20406-D02	215.8	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	SW
MARKEM CORPORATION	MARKEM CORPORATION	20406 20074-D01	--	(0.017)	##	(0.022)	(0.029)	(0.028)	(0.031)	(0.051)	(0.025)	(0.045)	(0.017)	(0.030)	(0.018)	TW
MARKEM CORPORATION	MARKEM CORPORATION	20406 20338-S01	--	0.017	##	0.022	0.029	0.028	0.031	0.051	0.025	0.045	0.017	0.030	0.018	TW
KEENE PUBLIC WATER DEPT	WATER WORKS - KEENE	20338 20338-S01	215.8	2.983	##	2.934	3.096	3.142	1.723	1.739	1.624	1.793	1.682	1.255	1.406	SW
KINGSBURY CORPORATION	KINGSBURY CORPORATION	20201 20201-D01	215.8	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	SW
MARLBOROUGH WATER WORKS	MARLBOROUGH WATER WORKS	20053 20053-S02	215.8	0.000	##	0.000	0.000	0.000	0.005	0.003	0.000	0.000	0.000	0.000	0.000	GW
MARLBOROUGH WATER WORKS	MARLBOROUGH WATER WORKS	20053 20053-S01	215.8	0.127	##	0.143	0.139	0.130	0.134	0.139	0.133	0.129	0.131	0.129	0.121	GW
CHESHIRE MEDICAL CENTER	CHESHIRE MEDICAL CENTER	20017 20338-S01	215.8	0.102	##	0.102	0.110	0.112	0.131	0.147	0.152	0.136	0.125	0.100	0.085	TW
KEENE COUNTRY CLUB	KEENE COUNTRY CLUB	20705 20705-S03	234.6	0.000	##	0.000	0.220	0.295	0.365	0.380	0.206	0.183	0.068	0.000	0.000	SW
KEENE COUNTRY CLUB	KEENE COUNTRY CLUB	20705 20705-S02	234.6	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	GW
KEENE COUNTRY CLUB	KEENE COUNTRY CLUB	20705 20705-S01	234.6	0.000	##	0.000	0.165	0.269	0.156	0.310	0.162	0.111	0.039	0.000	0.000	SW
KEENE PUBLIC WATER DEPT	WATER WORKS - KEENE	20338 20338-S02	234.6	0.339	##	0.535	0.352	0.279	1.153	1.178	1.104	0.981	1.156	1.062	1.033	GW
TROY WATER WORKS	TROY WATER WORKS	20451 20451-S03	288.6	0.074	##	0.073	0.082	0.087	0.083	0.078	0.078	0.075	0.079	0.062	0.065	GW
TROY WATER WORKS	TROY WATER WORKS	20451 20451-S02	288.6	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	GW
TROY WATER WORKS	TROY WATER WORKS	20451 20451-S01	288.6	0.072	##	0.088	0.087	0.083	0.086	0.057	0.052	0.053	0.056	0.073	0.072	SW
TROY WWTF	WASTE WATER TREAT PLANT	20449 20449-D01	288.6	(0.155)	##	(0.115)	(0.136)	(0.000)	(0.086)	(0.065)	(0.103)	(0.119)	(0.099)	0.000	(0.182)	SW
TROY MILLS INCORPORATED	TROY MILLS INCORPORATED	20111 20111-S01	288.6	0.008	##	0.028	0.013	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	SW
TROY MILLS INCORPORATED	TROY MILLS INCORPORATED	20111 20111-D01	288.6	(0.001)	##	(0.001)	(0.001)	(0.001)	(0.000)	0.000	0.000	0.000	0.000	0.000	0.000	SW
KEENE WWTF	KEENE POTW	20074 20074-D01	288.6	(4.361)	##	(6.548)	(7.721)	(5.488)	(4.660)	(3.560)	(4.684)	(4.361)	(5.180)	(6.011)	(7.327)	SW
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S02	380.0	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	GW
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S01	380.0	0.361	##	0.384	0.299	0.373	0.274	0.287	0.239	0.184	0.135	0.137	0.163	GW
BEAMAN LUMBER INC	BEAMAN LUMBER INC	20537 20537-S01	385.3	0.000	##	0.000	0.000	0.062	0.077	0.067	0.067	0.052	0.000	0.000	0.000	SW
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S03	385.3	0.432	##	0.429	0.436	0.436	0.424	0.431	0.448	0.441	0.425	0.440	0.425	GW
WINCHESTER WWTF	WINCHESTER WASTE WATER TREAT PLANT	20314 20314-D01	385.3	(0.328)	##	(0.433)	(0.498)	(0.402)	(0.355)	(0.341)	(0.332)	(0.317)	(0.343)	(0.392)	(0.445)	SW
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-S01	408.4	0.061	##	0.084	0.082	0.032	0.046	0.018	0.050	0.048	0.073	0.107	0.175	SW
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-D01	408.4	(0.061)	##	(0.084)	(0.082)	(0.032)	(0.046)	(0.018)	(0.050)	(0.048)	(0.073)	(0.107)	(0.175)	SW
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-S01	408.4	374.408	##	459.503	867.940	748.822	525.861	394.888	304.391	319.095	641.689	707.159	667.463	SW
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-D01	408.5	(374.408)	##	(459.503)	(867.940)	(748.822)	(525.861)	(394.888)	(304.391)	(319.095)	(641.689)	(707.159)	(667.463)	SW
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-S01	412.3	0.001	##	0.088	0.238	0.006	0.005	0.005	0.433	0.022	0.024	0.022	0.029	SW
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-S01	412.3	397.039	##	487.871	877.831	792.452	537.295	394.479	287.704	278.150	652.414	692.396	554.888	SW
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-D01	412.6	(0.001)	##	(0.088)	(0.238)	(0.006)	(0.005)	(0.004)	(0.039)	(0.020)	(0.024)	(0.022)	(0.029)	SW
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-D01	412.6	(397.039)	##	(487.871)	(877.831)	(792.452)	(537.295)	(394.479)	(287.704)	(278.150)	(652.414)	(692.396)	(554.888)	SW
HINSDALE WATER WORKS	HINSDALE WATER WORKS	20050 20050-S02	415.1	0.122	##	0.101	0.106	0.100	0.115	0.122	0.103	0.110	0.139	0.131	0.122	GW
HINSDALE WWTF	WASTE WATER TREAT PLANT	20089 20089-D01	421.2	(0.261)	##	(0.444)	(0.604)	(0.468)	(0.371)	(0.001)	(0.359)	(0.318)	(0.405)	(0.516)	(0.603)	SW
Start of Designated Reach			421.9													

2003 Ashuelot Aggregate Water Use in CFS

USERNAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
End of Designated Reach	End of Designated Reach		7.0	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MARLOW POWER	NASH DAM	20246 20246-S01	46.3	28.379	##	16.425	27.088	25.602	30.054	2.636	19.813	12.352	6.353	18.820	20.284
MARLOW POWER	NASH DAM	20246 20246-D01	46.3	0.000	##	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
KEENE PUBLIC WATER DEPT	WATER WORKS - KEENE	20338 20338-S03	108.5	0.359	##	0.424	0.354	0.344	1.466	1.733	1.480	1.559	1.324	1.331	1.318
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S03	115.6	0.359	##	0.424	0.361	0.351	1.473	1.740	1.487	1.566	1.331	1.331	1.318
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S02	115.6	0.359	##	0.424	0.362	0.352	1.474	1.741	1.488	1.567	1.332	1.331	1.318
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S01	115.6	0.359	##	0.424	0.374	0.364	1.486	1.753	1.500	1.579	1.344	1.331	1.318
The Branch (Minnewawa) confluence			215.8	3.469	##	3.502	3.610	3.637	3.349	3.633	3.257	3.502	3.156	2.715	2.879
Ash Swamp Brook confluence			234.6	3.808	##	4.037	4.347	4.480	5.023	5.500	4.729	4.776	4.420	3.777	3.913
South Branch confluence			288.6	(0.555)	##	(2.439)	(3.330)	(0.837)	0.446	2.012	0.072	0.423	(0.724)	(2.099)	(3.461)
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S02	380.0	(0.555)	##	(2.439)	(3.330)	(0.837)	0.446	2.012	0.072	0.423	(0.724)	(2.099)	(3.461)
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S01	380.0	(0.194)	##	(2.055)	(3.031)	(0.465)	0.720	2.299	0.311	0.608	(0.589)	(1.963)	(3.297)
Mirey Brook confluence			385.3	(0.090)	##	(2.059)	(3.093)	(0.369)	0.866	2.456	0.495	0.784	(0.507)	(1.915)	(3.317)
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-S01	408.4	(0.030)	##	(1.976)	(3.010)	(0.337)	0.913	2.473	0.545	0.832	(0.434)	(1.808)	(3.143)
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-D01	408.4	(0.090)	##	(2.059)	(3.093)	(0.369)	0.866	2.456	0.495	0.784	(0.507)	(1.915)	(3.317)
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-S01	408.4	374.318	##	457.443	864.847	748.453	526.727	397.343	304.886	319.879	641.182	705.244	664.145
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-D01	408.5	(0.090)	##	(2.059)	(3.093)	(0.369)	0.866	2.456	0.495	0.784	(0.507)	(1.915)	(3.317)
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-S01	412.3	(0.090)	##	(1.972)	(2.855)	(0.363)	0.872	2.460	0.928	0.806	(0.483)	(1.893)	(3.288)
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-S01	412.3	396.950	##	485.899	874.976	792.089	538.166	396.940	288.632	278.956	651.931	690.503	551.600
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-D01	412.6	396.949	##	485.812	874.738	792.083	538.161	396.935	288.592	278.936	651.907	690.481	551.571
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-D01	412.6	(0.090)	##	(2.060)	(3.093)	(0.369)	0.866	2.456	0.888	0.786	(0.507)	(1.915)	(3.317)
HINSDALE WATER WORKS	HINSDALE WATER WORKS	20050 20050-S02	415.1	0.032	##	(1.959)	(2.987)	(0.268)	0.981	2.578	0.991	0.896	(0.368)	(1.785)	(3.195)
HINSDALE WWTF	WASTE WATER TREAT PLANT	20089 20089-D01	421.2	(0.230)	##	(2.403)	(3.591)	(0.736)	0.611	2.577	0.632	0.578	(0.773)	(2.301)	(3.798)
Start of Designated Reach	Start of Designated Reach		421.9	(0.230)	##	(2.403)	(3.591)	(0.736)	0.611	2.577	0.632	0.578	(0.773)	(2.301)	(3.798)

#### 4. Table of Estimated Monthly Stream Flows and General Standard

### USGS 01161000 ASHUELOT RIVER AT HINSDALE, NH

DA(mi^2) 420

7Q10 (cfs) 45

	Mean of daily streamflows (2003) in cfs	Mean of monthly streamflows (POR = 93 years) in cfs	Median of monthly means (cfs)	Calculated 2003 monthly mean streamflow	General Standard in cfsm
Jan-03	604	604	565	1.44	0.04
Feb-03	603	604	481	1.43	0.04
Mar-03	1881	1238	1137	4.48	0.16
Apr-03	1990	1878	1890	4.74	0.16
May-03	934	990	841	2.22	0.04
Jun-03	570	523	394	1.36	0.04
Jul-03	118	276	191	0.28	0.0054
Aug-03	712	224	143	1.70	0.04
Sep-03	443	241	148	1.06	0.04
Oct-03	878	345	208	2.09	0.04
Nov-03	1290	585	480	3.07	0.04
Dec-03	1923	657	557	4.58	0.16

2003 daily data availability

77.3% = number of days with data in 2003 / 365 days

Using POR average streamflow for this month

Using interpolated values or POR average daily streamflows for part of this month



## USGS 01160350 ASHUELOT RIVER AT WEST SWANZEY, NH

DA(mi^2) 316.1

7Q10 (cfs) 21 \*

	Mean of daily streamflows (2003) in cfs	Mean of monthly streamflows (POR = 9 years) in cfs	Median of monthly means (cfs)	Calculated 2003 monthly mean streamflow	General Standard in cfsm
Jan-03	560	560	562.5	1.77	0.04
Feb-03	484	492	447	1.53	0.04
Mar-03	1463	893	844.5	4.63	0.16
Apr-03	1646	1360	1095	5.21	0.16
May-03	729	730	694	2.31	0.04
Jun-03	405	402	300	1.28	0.04
Jul-03	88	187	137	0.28	0.0033
Aug-03	555	128	71.3	1.76	0.04
Sep-03	300	141	79.3	0.95	0.02
Oct-03	604	331	255.5	1.91	0.04
Nov-03	1024	489	372	3.24	0.04
Dec-03	1585	551	367.5	5.02	0.16

2003 daily data availability

77.0% = number of days with data in 2003 / 365 days

Using POR average streamflow for this month

Using interpolated values or POR average daily streamflows for part of this month

\* Determined by averaging the Hinsdale and Surry Mtn. gages.

## USGS 01158000 ASHUELOT RIVER BELOW SURRY MT DAM, NEAR

DA(mi^2) 101

7Q10 (cfs) 2.8

	Mean of daily streamflows (2003)(cfs)	Mean of monthly streamflows (POR= 51 years) (cfs)	Median of monthly means (cfs)	Calculated 2003 monthly mean streamflow	General Standard in cfsm
Jan-03	95	148	130	0.94	0.02
Feb-03	57	154	122	0.56	0.02
Mar-03	319	281	272	3.16	0.04
Apr-03	633	548	554	6.26	0.16
May-03	236	284	285	2.33	0.04
Jun-03	103	136	127	1.02	0.04
Jul-03	14	54	33	0.14	0.0014
Aug-03	313	40	21	3.10	0.04
Sep-03	129	51	32	1.27	0.04
Oct-03	241	100	53	2.39	0.04
Nov-03	356	159	139	3.52	0.04
Dec-03	493	176	145	4.88	0.16

2003 daily data availability

96.2% = number of days with data in 2003 / 365 days

Using POR average streamflow for this month

Using interpolated values or POR average daily streamflows for part of this month

2003 Ashuelot Estimated

Monthly Stream Flow at Each  
Impact Point in CFS

USGS 01158000 ASHUELOT RIVER BELOW  
SURRY MT DAM, NEAR KEENE, NH

USGS 01160350 ASHUELOT RIVER AT WEST  
SWANZEY, NH

USGS 01161000 ASHUELOT RIVER AT  
HINSDALE, NH

Calculated 2003 monthly mean streamflow in CFSM	101	0.94	##	3.16	6.26	2.33	1.02	0.14	3.10	1.27	2.39	3.52	4.88
Calculated 2003 monthly mean streamflow in CFSM	316.1	1.77	##	4.63	5.21	2.31	1.28	0.28	1.76	0.95	1.91	3.24	5.02
Calculated 2003 monthly mean streamflow in CFSM	420	1.44	##	4.48	4.74	2.22	1.36	0.28	1.70	1.06	2.09	3.07	4.58
DA on DR (SQ MILE)		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
End of Designated Reach	7.0		6.6 4.0	22.1	43.9	16.4	7.2	1.0	21.8	8.9	16.7	24.7	34.2
MARLOW POWER	46.3		43.4 ##	146.4	290.2	108.1	47.4	6.5	143.8	59.0	110.7	163.3	226.2
MARLOW POWER	46.3		43.4 ##	146.4	290.2	108.1	47.4	6.5	143.8	59.0	110.7	163.3	226.2
KEENE PUBLIC WATER DEPT	108.5		104.7 ##	348.2	675.4	252.9	112.0	15.7	331.5	136.9	257.3	381.2	530.1
KEENE STATE COLLEGE	115.6		114.8 ##	376.7	715.6	269.4	120.4	17.2	348.1	144.7	272.4	405.1	565.4
KEENE STATE COLLEGE	115.6		114.8 ##	376.7	715.8	269.4	120.4	17.2	348.2	144.7	272.4	405.2	565.5
KEENE STATE COLLEGE	115.6		114.8 ##	376.7	715.8	269.4	120.4	17.2	348.2	144.7	272.4	405.2	565.5
The Branch (Minnewawa) confluence	215.8		298.5 ##	851.1	1230.1	500.4	250.5	46.2	514.5	237.5	460.4	727.8	1069.2
Ash Swamp Brook confluence	234.6		341.5 ##	955.1	1315.4	543.4	277.6	53.0	531.7	251.5	490.6	785.2	1164.9
South Branch confluence	288.6		537.3 ##	1346.8	1538.5	672.0	363.5	80.2	511.2	265.7	537.5	947.3	1480.9
WINCHESTER WATER WORKS	380.0		595.3 ##	1723.8	1869.2	857.1	504.5	106.7	653.3	385.5	767.8	1191.7	1803.8
WINCHESTER WATER WORKS	380.0		595.3 ##	1723.8	1869.2	857.1	504.5	106.7	653.3	385.5	767.8	1191.7	1803.8
Mirey Brook confluence	385.3		597.0 ##	1745.0	1886.2	867.4	513.1	108.3	661.2	393.0	782.1	1205.1	1820.4
PAPER SERVICE LTD	408.4		602.3 ##	1836.0	1956.7	911.8	550.8	115.0	695.4	426.2	845.2	1262.2	1889.8
PAPER SERVICE LTD	408.4		602.3 ##	1836.2	1956.8	911.9	550.9	115.0	695.5	426.3	845.3	1262.3	1889.9
ALGONQUIN POWER SYST INC	408.4		602.3 ##	1836.0	1956.7	911.8	550.8	115.0	695.4	426.2	845.2	1262.2	1889.8
ALGONQUIN POWER SYST INC	408.5		602.3 ##	1836.5	1957.0	912.1	551.0	115.1	695.6	426.4	845.5	1262.5	1890.1
ATLANTIC PAPER MILLS OF NH	412.3		602.9 ##	1851.2	1968.1	919.2	557.3	116.2	701.2	431.9	856.0	1271.7	1901.0
ALGONQUIN POWER SYST INC	412.3		602.9 ##	1851.2	1968.1	919.2	557.3	116.2	701.2	431.9	856.0	1271.7	1901.0
ATLANTIC PAPER MILLS OF NH	412.6		602.9 ##	1852.5	1969.0	919.9	557.8	116.3	701.6	432.4	856.9	1272.5	1902.0
ALGONQUIN POWER SYST INC	412.6		602.9 ##	1852.5	1969.0	919.9	557.8	116.3	701.6	432.4	856.9	1272.5	1902.0
HINSDALE WATER WORKS	415.1		603.2 ##	1862.1	1976.2	924.5	561.9	117.0	705.3	436.0	863.8	1278.4	1909.0
HINSDALE WWTF	421.2		605.4 ##	1886.8	1996.2	936.6	571.8	118.8	714.6	444.7	880.3	1294.1	1928.7
Start of Designated Reach	421.9		606.4 ##	1889.9	1999.5	938.2	572.7	119.0	715.7	445.4	881.7	1296.3	1931.9

2003 Ashuelot Estimated  
Monthly General Standard at  
Each Impact Point in CFS

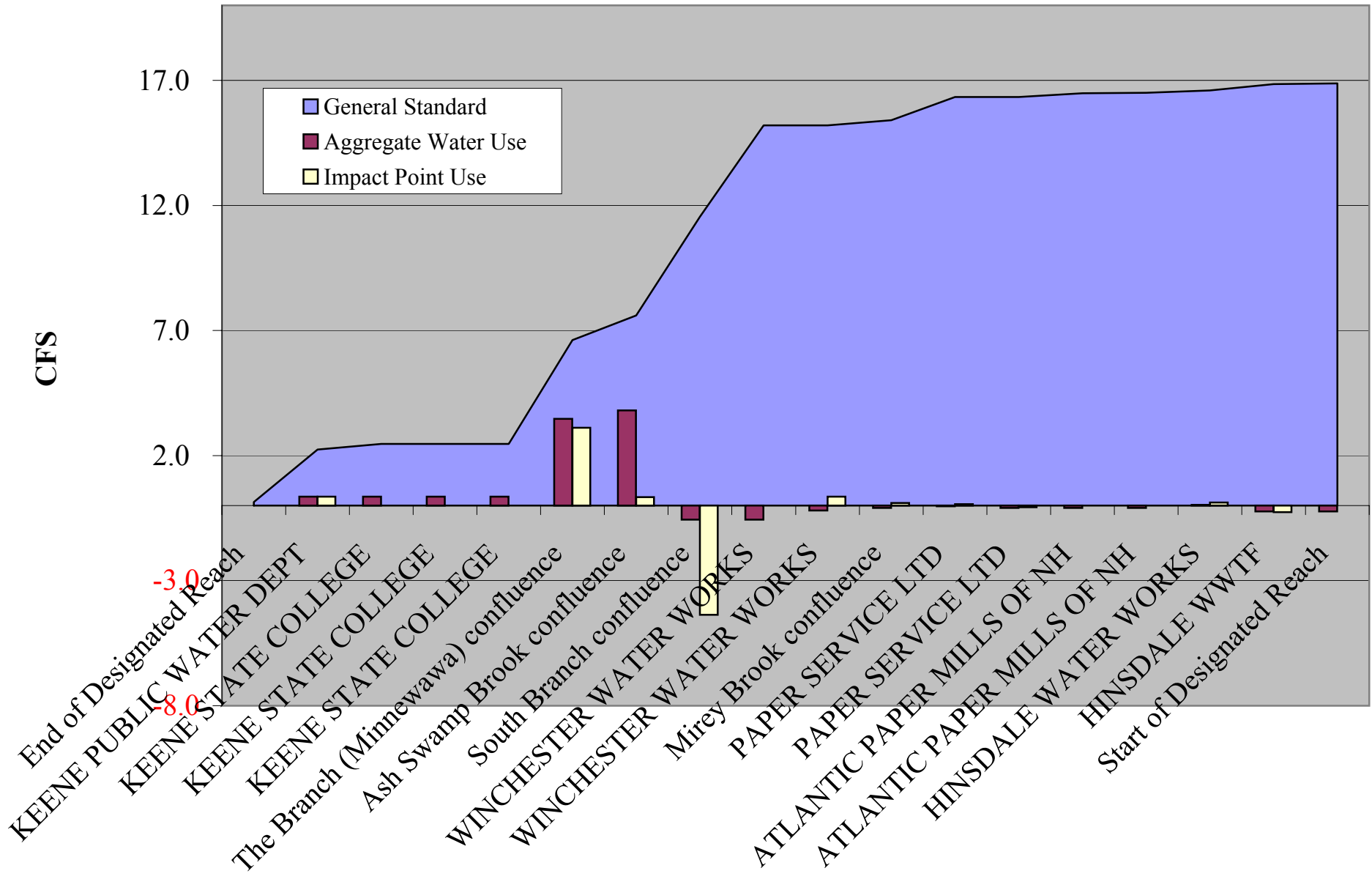
USGS 01158000 ASHUELOT RIVER BELOW  
SURRY MT DAM, NEAR KEENE, NH  
USGS 01160350 ASHUELOT RIVER AT WEST  
SWANZEY, NH  
USGS 01161000 ASHUELOT RIVER AT  
HINSDALE, NH

		General Standard in cfsm	101												
		General Standard in cfsm		0.02	0	0.04	0.16	0.04	0.04	0.0014	0.04	0.04	0.04	0.04	0.16
		General Standard in cfsm		0.04	0	0.16	0.16	0.04	0.04	0.0033	0.04	0.02	0.04	0.04	0.16
		General Standard in cfsm		0.04	0	0.16	0.16	0.04	0.04	0.0054	0.04	0.04	0.04	0.04	0.16
		DA on DR (SQ MILE)													
USERNAME	FACILITY	WUSD_ID		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
End of Designated Reach	End of Designated Reach		7.0		0.1 0.1	0.3	1.1	0.3	0.3	0.0	0.3	0.3	0.3	0.3	1.1
MARLOW POWER	NASH DAM	20246 20246-S01	46.3		0.9 0.9	1.9	7.4	1.9	1.9	0.1	1.9	1.9	1.9	1.9	7.4
MARLOW POWER	NASH DAM	20246 20246-D01	46.3		0.9 0.9	1.9	7.4	1.9	1.9	0.1	1.9	1.9	1.9	1.9	7.4
KEENE PUBLIC WATER DEPT	WATER WORKS - KEENE	20338 20338-S03	108.5		2.2 2.2	4.8	17.4	4.3	4.3	0.2	4.3	4.3	4.3	4.3	17.4
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S03	115.6		2.5 2.5	5.6	18.5	4.6	4.6	0.2	4.6	4.5	4.6	4.6	18.5
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S02	115.6		2.5 2.5	5.6	18.5	4.6	4.6	0.2	4.6	4.5	4.6	4.6	18.5
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S01	115.6		2.5 2.5	5.6	18.5	4.6	4.6	0.2	4.6	4.5	4.6	4.6	18.5
The Branch (Minnewawa) confluence			215.8		6.6 6.6	22.5	34.5	8.6	8.6	0.5	8.6	6.3	8.6	8.6	34.5
Ash Swamp Brook confluence			234.6		7.6 7.6	26.9	37.5	9.4	9.4	0.6	9.4	6.5	9.4	9.4	37.5
South Branch confluence			288.6		11.5 ##	46.2	46.2	11.5	11.5	0.8	11.5	4.2	11.5	11.5	46.2
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S02	380.0		15.2 ##	60.8	60.8	15.2	15.2	1.7	15.2	12.3	15.2	15.2	60.8
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S01	380.0		15.2 ##	60.8	60.8	15.2	15.2	1.7	15.2	12.3	15.2	15.2	60.8
Mirey Brook confluence	Mirey Brook confluence		385.3		15.4 ##	61.6	61.6	15.4	15.4	1.8	15.4	12.8	15.4	15.4	61.6
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-S01	408.4		16.3 ##	65.3	65.3	16.3	16.3	2.1	16.3	15.4	16.3	16.3	65.3
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-D01	408.4		16.3 ##	65.3	65.3	16.3	16.3	2.1	16.3	15.4	16.3	16.3	65.3
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-S01	408.4		16.3 ##	65.3	65.3	16.3	16.3	2.1	16.3	15.4	16.3	16.3	65.3
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-D01	408.5		16.3 ##	65.4	65.4	16.3	16.3	2.1	16.3	15.4	16.3	16.3	65.4
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-S01	412.3		16.5 ##	66.0	66.0	16.5	16.5	2.1	16.5	15.9	16.5	16.5	66.0
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-S01	412.3		16.5 ##	66.0	66.0	16.5	16.5	2.1	16.5	15.9	16.5	16.5	66.0
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-D01	412.6		16.5 ##	66.0	66.0	16.5	16.5	2.2	16.5	15.9	16.5	16.5	66.0
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-D01	412.6		16.5 ##	66.0	66.0	16.5	16.5	2.2	16.5	15.9	16.5	16.5	66.0
HINSDALE WATER WORKS	HINSDALE WATER WORKS	20050 20050-S02	415.1		16.6 ##	66.4	66.4	16.6	16.6	2.2	16.6	16.2	16.6	16.6	66.4
HINSDALE WWTF	WASTE WATER TREAT PLANT	20089 20089-D01	421.2		16.8 ##	67.4	67.4	16.8	16.8	2.3	16.8	16.8	16.8	16.8	67.4
Start of Designated Reach	Start of Designated Reach		421.9		16.9 ##	67.5	67.5	16.9	16.9	2.3	16.9	16.9	16.9	16.9	67.5

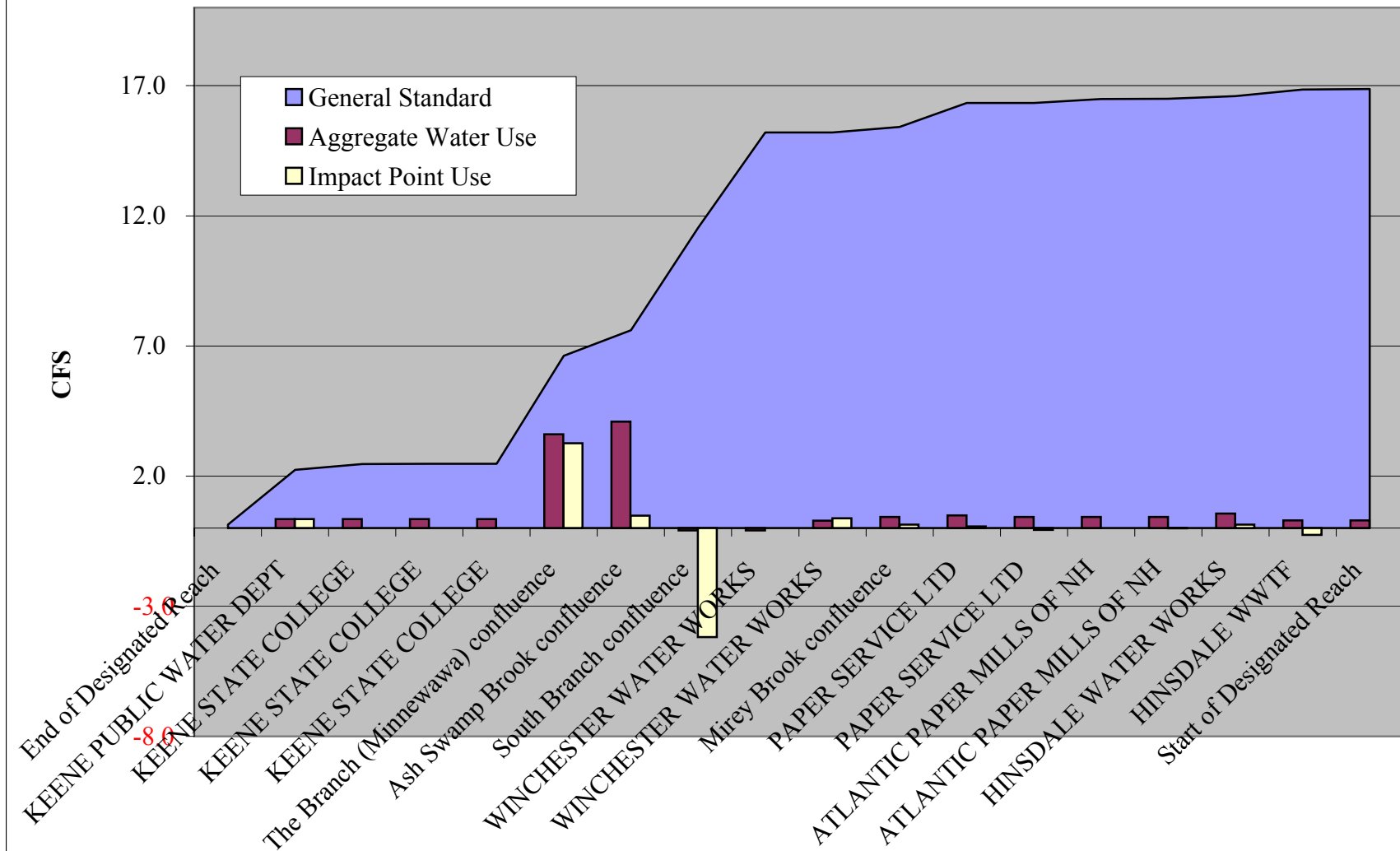
2003 Ashuelot Estimated  
Monthly Margin of the  
Aggregate Water Use Below  
the General Standard

USERNAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
End of Designated Reach	End of Designated Reach		7.0		0.1 ##	0.3	1.1	0.3	0.3	0.0	0.3	0.3	0.3	0.3	1.1
MARLOW POWER	NASH DAM	20246 20246-S01	46.3		(27.5) ##	(14.6)	(19.7)	(23.7)	(28.2)	(2.6)	(18.0)	(10.5)	(4.5)	(17.0)	(12.9)
MARLOW POWER	NASH DAM	20246 20246-D01	46.3		0.9 ##	1.9	7.4	1.9	1.9	0.1	1.9	1.9	1.9	1.9	7.4
KEENE PUBLIC WATER DEPT	WATER WORKS - KEENE	20338 20338-S03	108.5		1.9 ##	4.4	17.0	4.0	2.9	(1.6)	2.9	2.7	3.0	3.0	16.0
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S03	115.6		2.1 ##	5.1	18.1	4.3	3.2	(1.6)	3.1	2.9	3.3	3.3	17.2
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S02	115.6		2.1 ##	5.1	18.1	4.3	3.1	(1.6)	3.1	2.9	3.3	3.3	17.2
KEENE STATE COLLEGE	KEENE STATE COLLEGE - ATHLETIC FIELDS	20757 20757-S01	115.6		2.1 ##	5.1	18.1	4.3	3.1	(1.6)	3.1	2.9	3.3	3.3	17.2
The Branch (Minnewawa) confluence			215.8		3.2 ##	19.0	30.9	5.0	5.3	(3.1)	5.4	2.8	5.5	5.9	31.7
Ash Swamp Brook confluence			234.6		3.8 ##	22.8	33.2	4.9	4.4	(4.9)	4.7	1.7	5.0	5.6	33.6
South Branch confluence			288.6		12.1 ##	48.6	49.5	12.4	11.1	(1.2)	11.5	3.8	12.3	13.6	49.6
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S02	380.0		15.8 ##	63.2	64.1	16.0	14.8	(0.3)	15.1	11.8	15.9	17.3	64.3
WINCHESTER WATER WORKS	WINCHESTER WATER WORKS	20434 20434-S01	380.0		15.4 ##	62.9	63.8	15.7	14.5	(0.6)	14.9	11.7	15.8	17.2	64.1
Mirey Brook confluence	Mirey Brook confluence		385.3		15.5 ##	63.7	64.7	15.8	14.5	(0.7)	14.9	12.1	15.9	17.3	65.0
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-S01	408.4		16.4 ##	67.3	68.3	16.7	15.4	(0.4)	15.8	14.6	16.8	18.1	68.5
PAPER SERVICE LTD	PAPER SERVICE LTD	20137 20137-D01	408.4		16.4 ##	67.4	68.4	16.7	15.5	(0.4)	15.8	14.6	16.8	18.3	68.7
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-S01	408.4		(358.0) ##	(392.1)	(799.5)	(732.1)	(510.4)	(395.2)	(288.6)	(304.5)	(624.8)	(688.9)	(598.8)
ALGONQUIN POWER SYST INC	LOWER ROBERTSON DAM	20590 20590-D01	408.5		16.4 ##	67.4	68.5	16.7	15.5	(0.4)	15.8	14.7	16.8	18.3	68.7
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-S01	412.3		16.6 ##	67.9	68.8	16.9	15.6	(0.3)	15.6	15.1	17.0	18.4	69.2
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-S01	412.3		(380.5) ##	(419.9)	(809.0)	(775.6)	(521.7)	(394.8)	(272.1)	(263.1)	(635.4)	(674.0)	(485.6)
ATLANTIC PAPER MILLS OF NH	ATLANTIC PAPER MILLS OF NH	20627 20627-D01	412.6		(380.4) ##	(419.8)	(808.7)	(775.6)	(521.7)	(394.8)	(272.1)	(263.0)	(635.4)	(674.0)	(485.6)
ALGONQUIN POWER SYST INC	ASHUELOT PAPER DAM	20589 20589-D01	412.6		16.6 ##	68.1	69.1	16.9	15.6	(0.3)	15.6	15.1	17.0	18.4	69.3
HINSDALE WATER WORKS	HINSDALE WATER WORKS	20050 20050-S02	415.1		16.6 ##	68.4	69.4	16.9	15.6	(0.4)	15.6	15.3	17.0	18.4	69.6
HINSDALE WWTF	WASTE WATER TREAT PLANT	20089 20089-D01	421.2		17.1 ##	69.8	71.0	17.6	16.2	(0.3)	16.2	16.3	17.6	19.2	71.2
Start of Designated Reach	Start of Designated Reach		421.9		17.1 ##	69.9	71.1	17.6	16.3	(0.3)	16.2	16.3	17.6	19.2	71.3

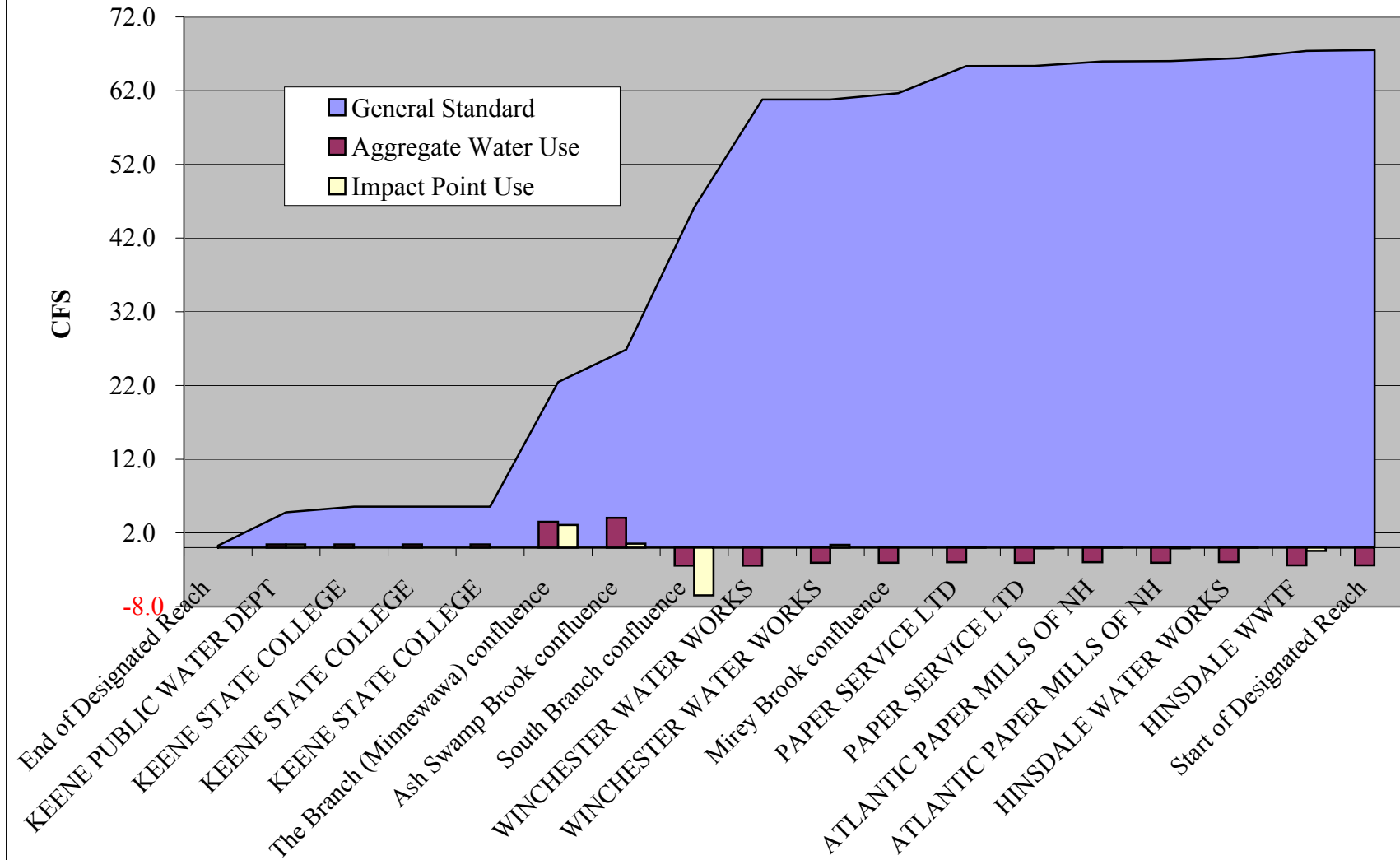
# January 2003 Ashuelot



## February 2003 Ashuelot

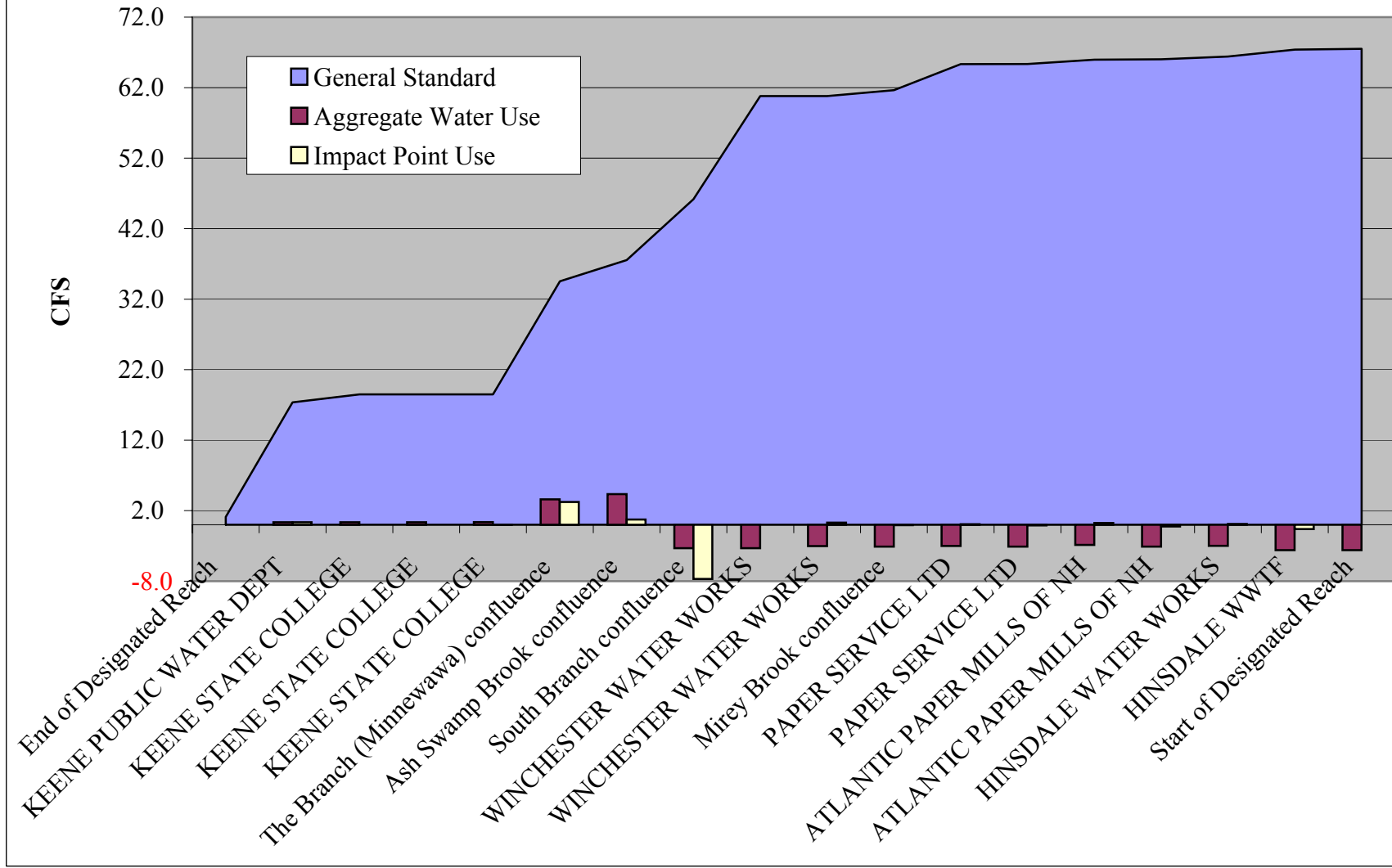


## March2003 Ashuelot

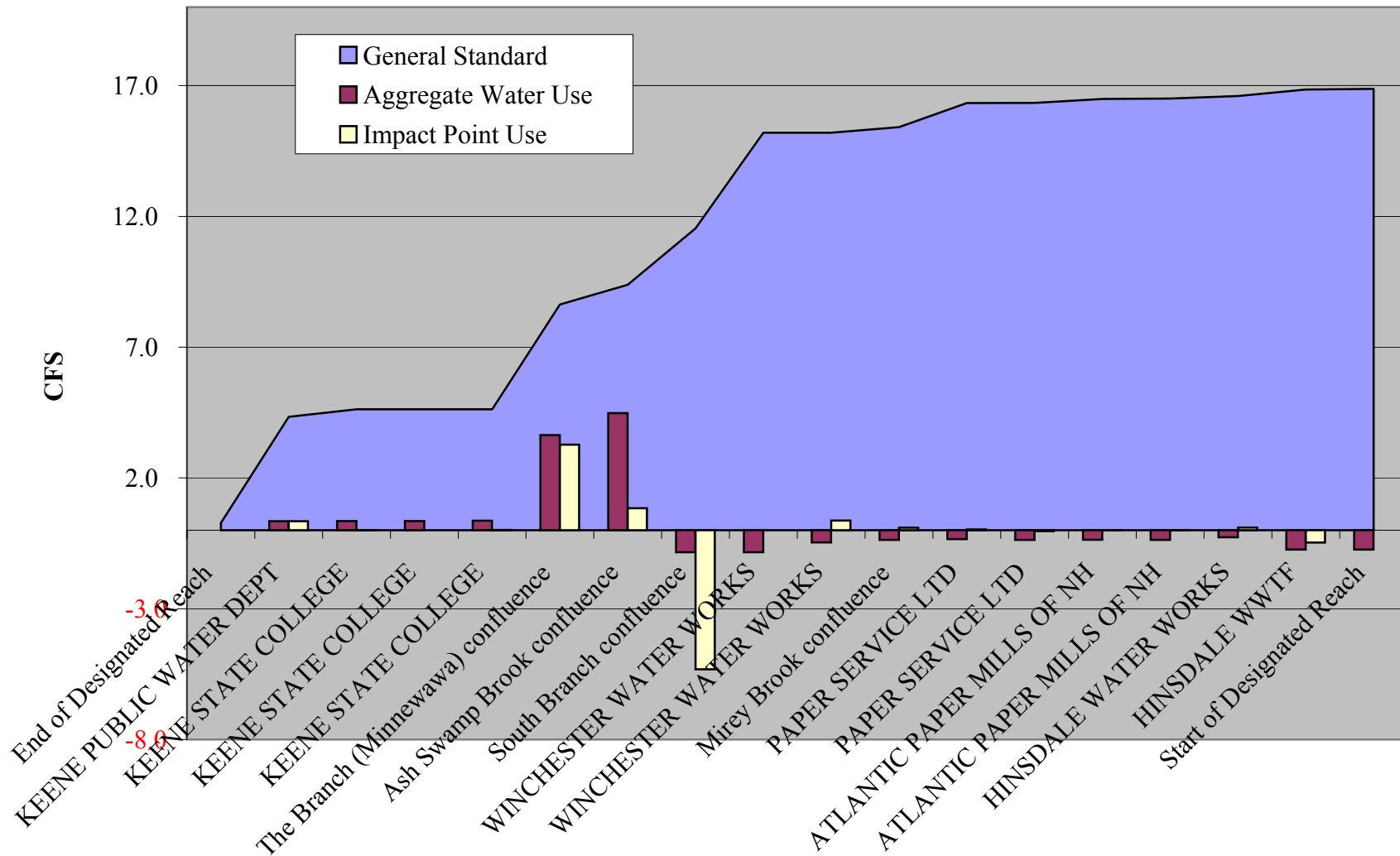




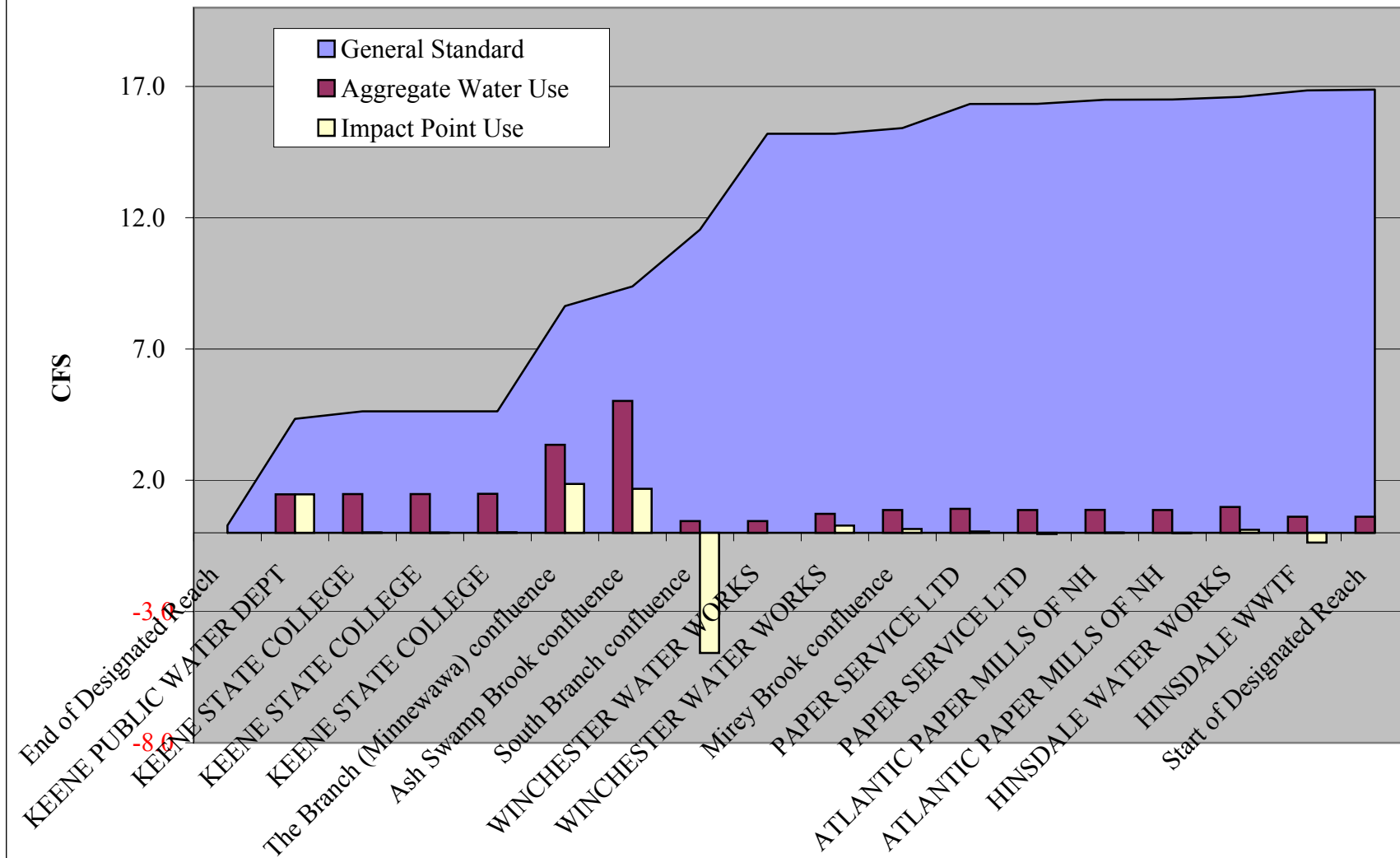
## April 2003 Ashuelot



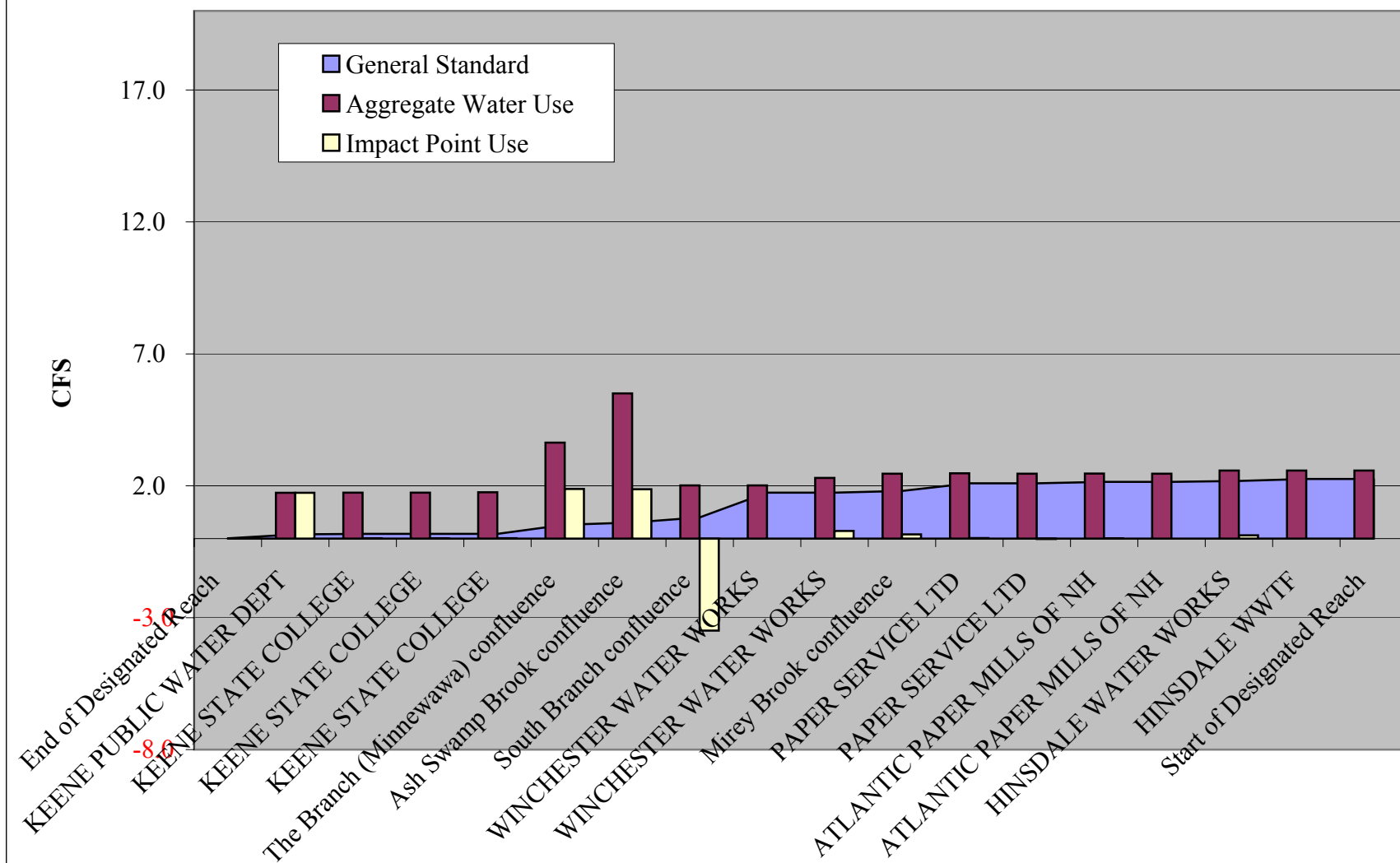
## May 2003 Ashuelot



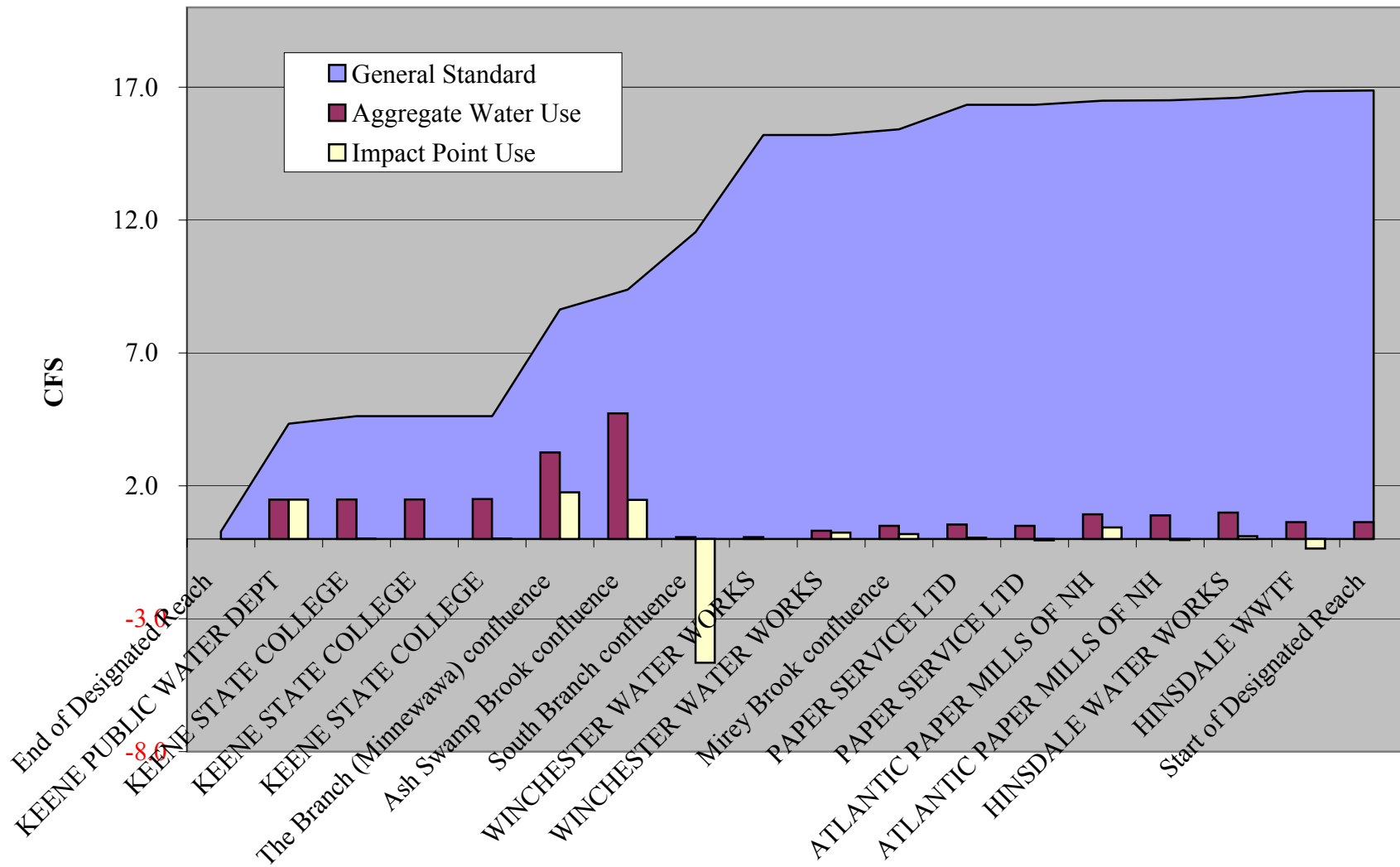
## June 2003 Ashuelot



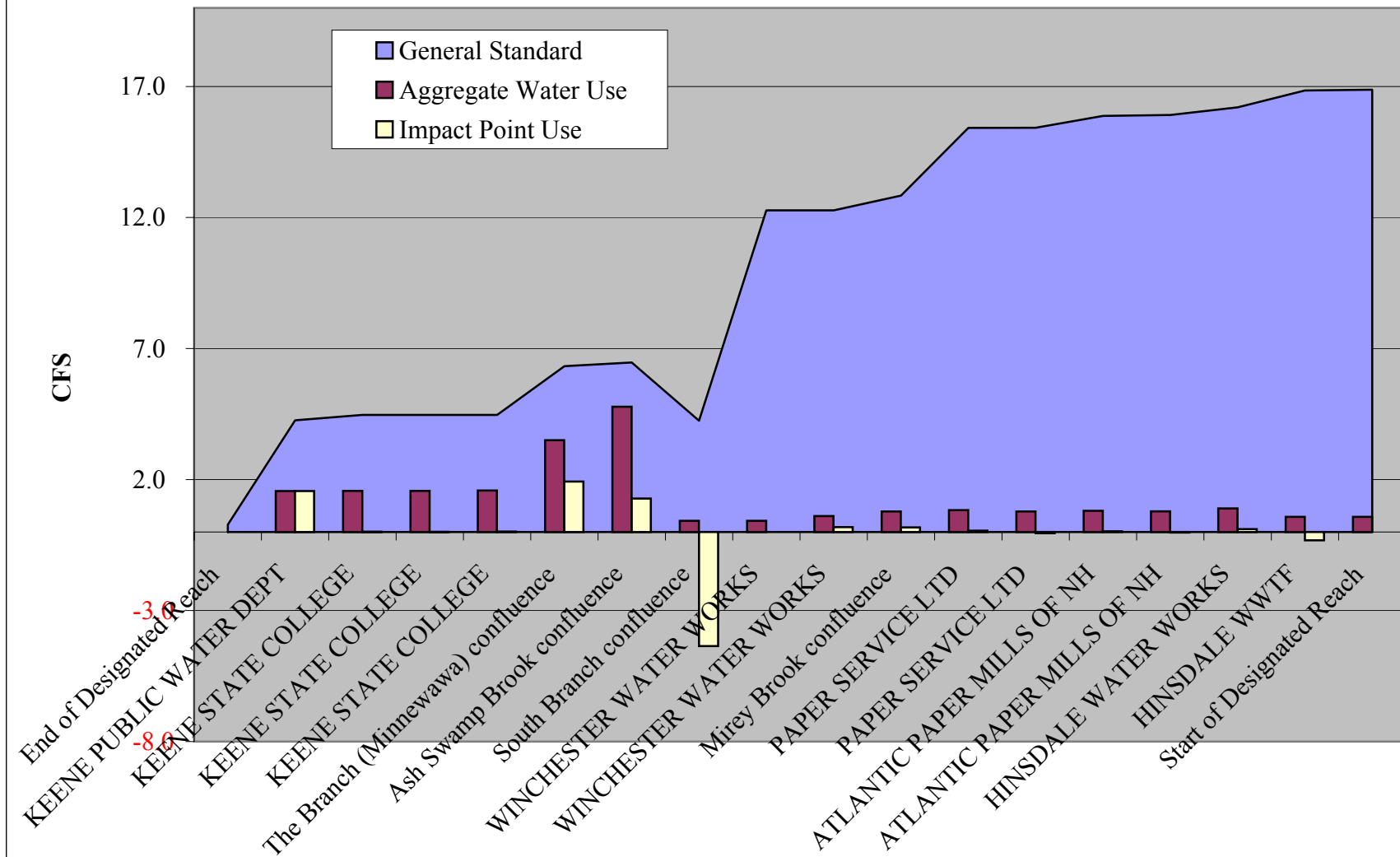
## July 2003 Ashuelot



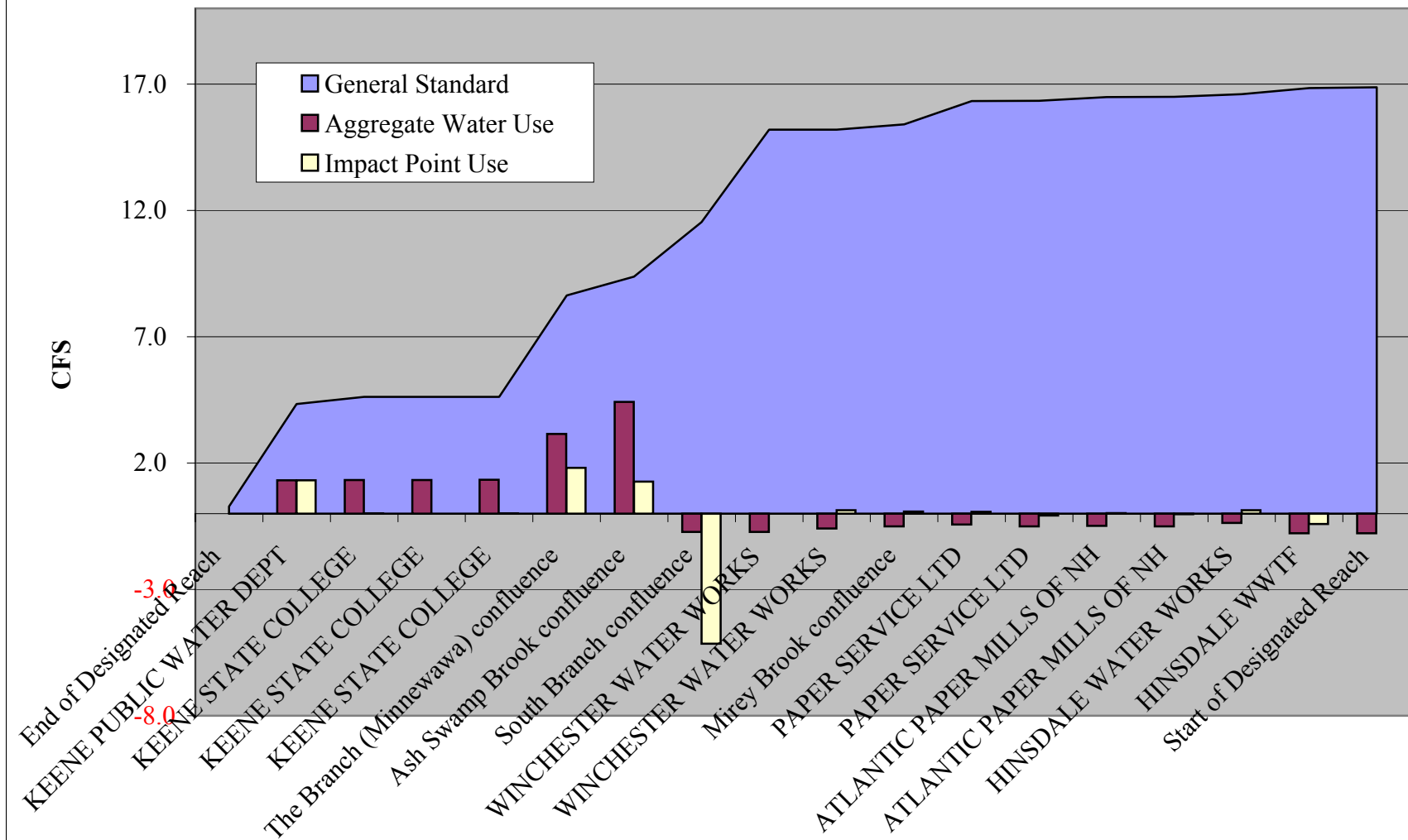
## August 2003 Ashuelot



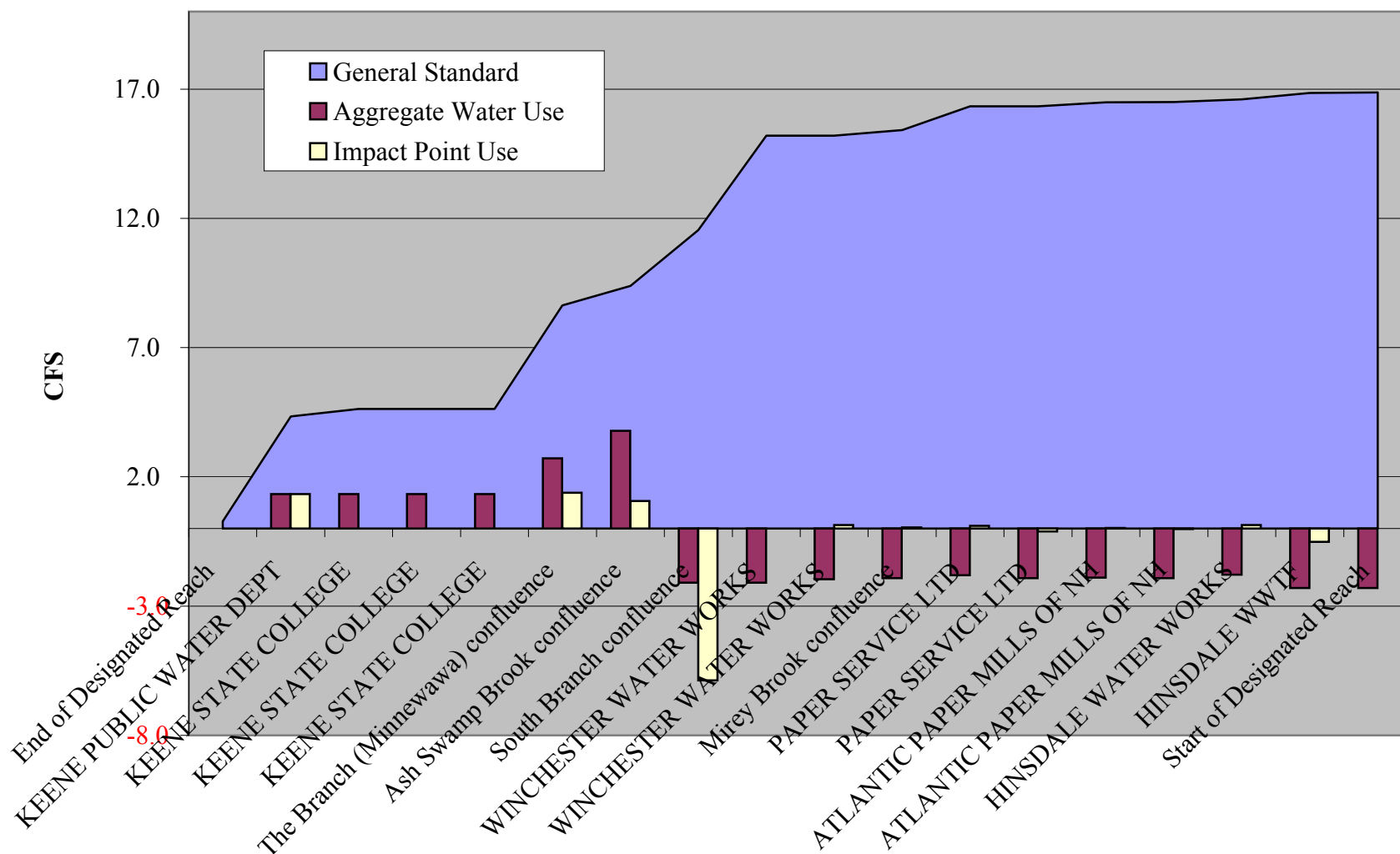
## September 2003 Ashuelot



## October 2003 Ashuelot

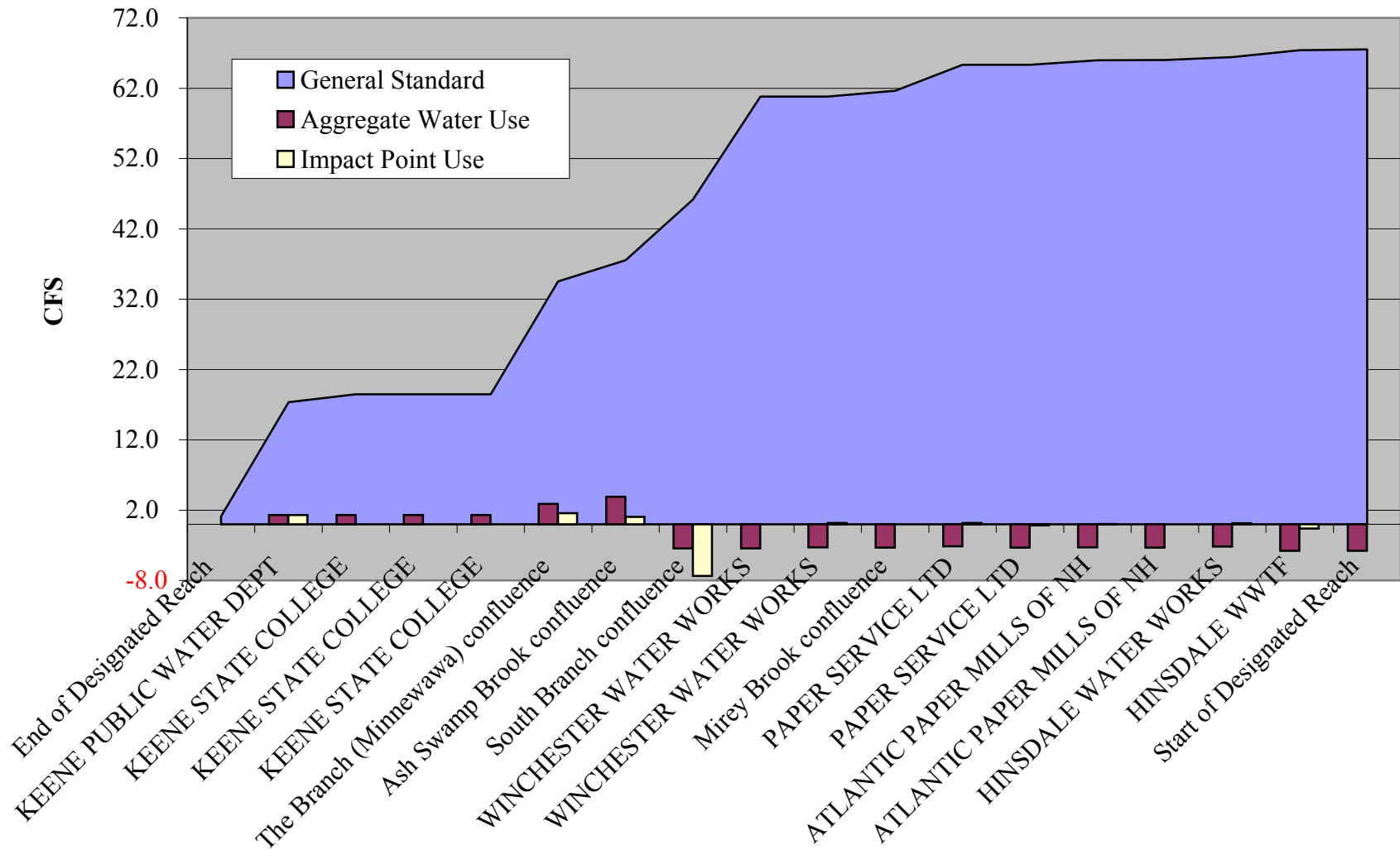


## November 2003 Ashuelot





## December 2003 Ashuelot



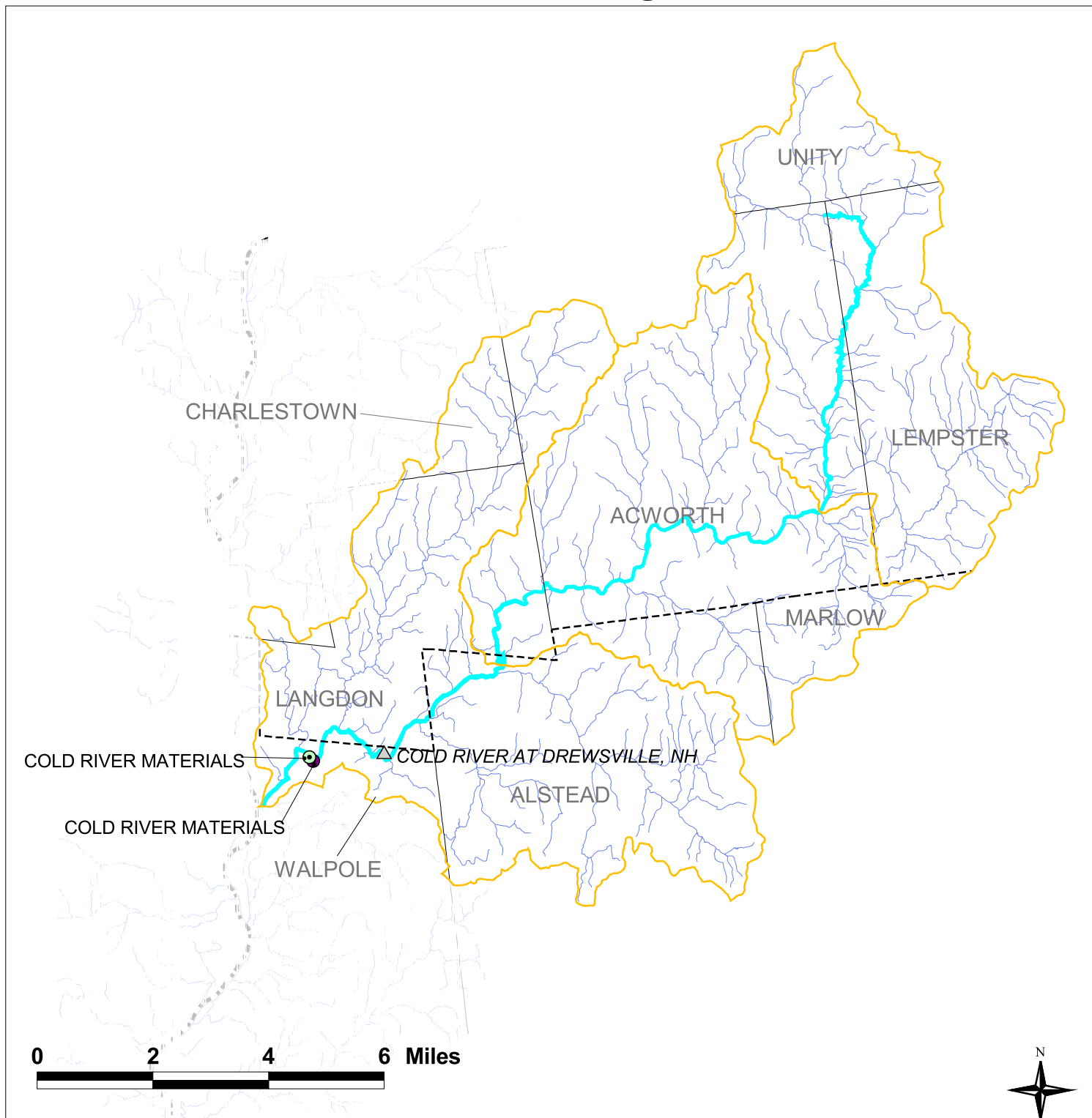
## Cold River Annual Water Use versus Stream Flow – Calendar Year 2003

The Cold River Water Management Planning Area (WMPA) covers 102 square miles. A surrogate gage (USGS 01154000 SAXTONS RIVER AT SAXTONS RIVER, VT) was used in conjunction with historical data from the USGS 01155000 COLD RIVER AT DREWSVILLE, NH gage to define streamflow on the Cold River for 2003. The Saxton River gage measures 72.2 square miles and has collected daily streamflow data since 1940. The Cold River gage at Drewsville measured 82.7 square miles of the Cold River WMPA from 1940 to 1978. Streamflow data from the gage at Drewsville was adjusted by linear regression of data from both gages to simulate data for the Cold River gage for 2003. This process is described in the main report. The 7Q10 value was taken from a published USGS report (WRI 02-4298).

There were no months when the General Standard was exceeded.

The Cold River Water Management Planning Area has one Affected Water User with one impact point on the Designated Reach, which is Cold River Materials. Cold River Materials registered one source and one discharge on the Designated River; however no data were reported for the discharge in 2003. Water use by the facility has changed from gravel washing to use only for dust suppression on roads. The source is a cistern at the edge of the Cold River. Reported water use in 2003 occurred only in April, May, June and August.

# Cold River Affected Water User Facilities: Source and Discharge Locations



## Legend

### Affected Water Users

- Source
- Discharge

### Stream Gages

- ▲ Active
- △ Inactive

- Designated Reach
- Hydrology
- State boundary
- Town boundary
- WMPA

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Map produced January 28, 2004

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### 2003 Cold Water Use in CFS

[illegible]

2003 Cold Aggregate Water Use in CFS

USERNAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
End of Designated Reach		End of Designated Reach	5.69												
LANE CONSTRUCTION CORP	COLD RIVER MATERIALS	20216 20216-S01	99.04	0.000	0.000	0.000	0.000	0.0045	0.037	0.000	0.000	0.0046	0.000	0.000	0.000
Start of Designated Reach		Start of Designated Reach	101.60	0.000	0.000	0.000	0.000	0.0045	0.037	0.000	0.000	0.0046	0.000	0.000	0.000

#### 4. Table of Estimated Monthly Stream Flows and General Standard Values

##### USGS 01155000 COLD RIVER AT DREWSVILLE, NH

from USGS 01154000 SAXTONS RIVER AT SAXTONS RIVER, VT data

DA(mi^2) 82.7

7Q10 (cfs) 4.18

	Monthly mean of daily streamflows (2003) in cfs for surrogate gage at Saxton River VT	Calculated monthly mean for Cold River at Drewsville	Mean of monthly means for Cold River 1940-1978 (cfs)	Median of monthly means for Cold River 1940-1978 (cfs)	Calculated 2003 monthly mean streamflow in CFSM	General Standard in cfsm
Jan-03	93	91	93	80	1.10	0.04
Feb-03	92	90	92	70	1.09	0.04
Mar-03	426	408	218	203	4.93	0.16
Apr-03	367	352	400	376	4.26	0.16
May-03	164	159	181	163	1.92	0.04
Jun-03	80	79	79	61	0.96	0.02
Jul-03	27	29	34	24	0.34	0.0025
Aug-03	214	207	26	16	2.50	0.04
Sep-03	115	112	28	19	1.36	0.04
Oct-03	241	232	51	26	2.80	0.04
Nov-03	264	254	105	73	3.07	0.04
Dec-03	337	323	109	81	3.91	0.04

##### *Coefficients*

Intercept	2.69486604
X Variable 1	0.95097513

Using POR average streamflow for this month

Using POR average daily streamflows for part of this month

2003 Cold Estimated Monthly Stream Flow at  
Each Impact Point in CFS

USERNAME	FACILITY	WUSD_ID
End of Designated Reach		End of Designated Reach
LANE CONSTRUCTION CORP	COLD RIVER MATERIALS	20216 20216-S01
Start of Designated Reach		Start of Designated Reach

Estimated 2003 monthly mean streamflow in CFSM	1.10	1.09	4.93	4.26	1.92	0.96	0.34	2.50	1.36	2.80	3.07	3.91
DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5.69	6	6	28	24	11	5	2	14	8	16	17	22
99.04	109	108	488	421	190	95	34	247	134	278	304	387
101.60	112	111	501	432	195	97	35	254	138	285	312	397

2003 Cold Estimated Monthly General  
Standard at Each Impact Point in CFS

USERNAME	FACILITY	WUSD_ID
End of Designated Reach		End of Designated Reach
LANE CONSTRUCTION CORP	COLD RIVER MATERIALS	20216 20216-S01
Start of Designated Reach		Start of Designated Reach

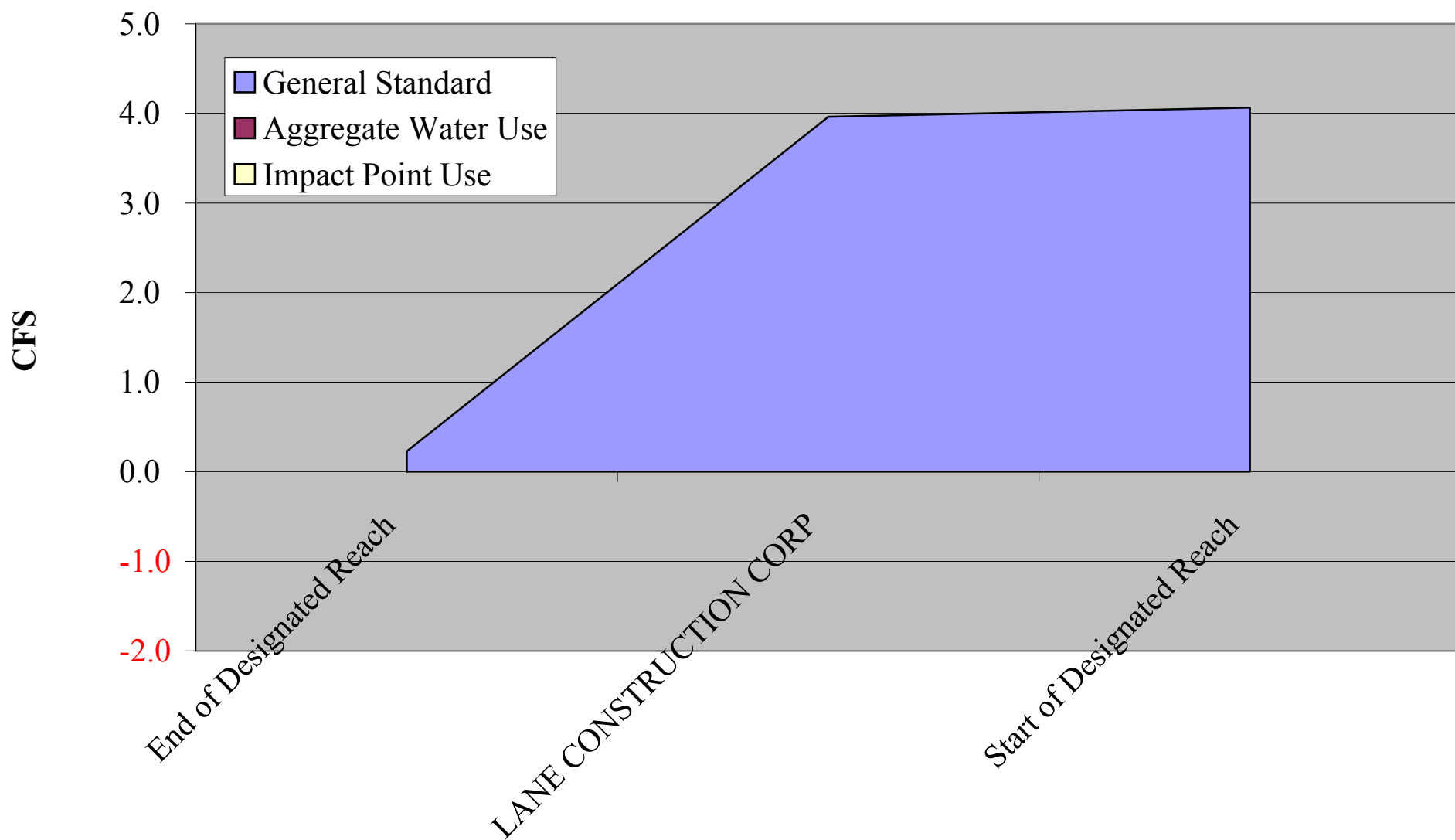
General Standard in cfsm	0.04	0.04	0.16	0.16	0.04	0.02	0.0025	0.04	0.04	0.04	0.04	0.04
DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5.69	0.23	0.23	0.91	0.91	0.23	0.11	0.01	0.23	0.23	0.23	0.23	0.23
99.04	3.96	3.96	15.85	15.85	3.96	1.98	0.25	3.96	3.96	3.96	3.96	3.96
101.60	4.06	4.06	16.26	16.26	4.06	2.03	0.26	4.06	4.06	4.06	4.06	4.06



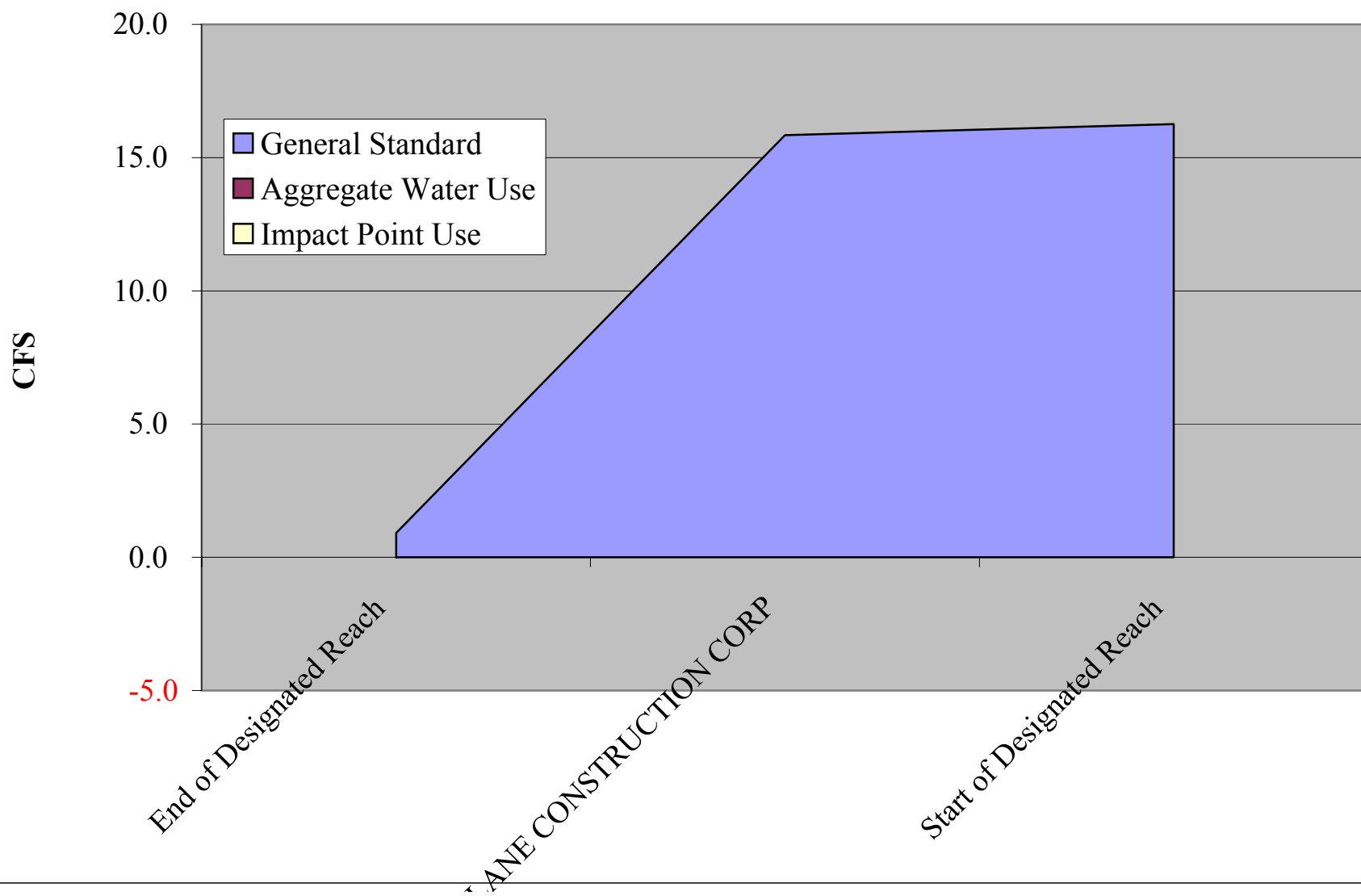
Aggregate Water Use Below the General Standard

USERNAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
End of Designated Reach		End of Designated Reach	5.69	0.23	0.23	0.91	0.91	0.23	0.11	0.01	0.23	0.23	0.23	0.23	0.23
LANE CONSTRUCTION CORP	COLD RIVER MATERIALS	20216 20216-S01	99.04	3.96	3.96	15.85	15.85	3.96	1.94	0.25	3.96	3.96	3.96	3.96	3.96
Start of Designated Reach		Start of Designated Reach	101.60	4.06	4.06	16.26	16.26	4.06	1.99	0.26	4.06	4.06	4.06	4.06	4.06

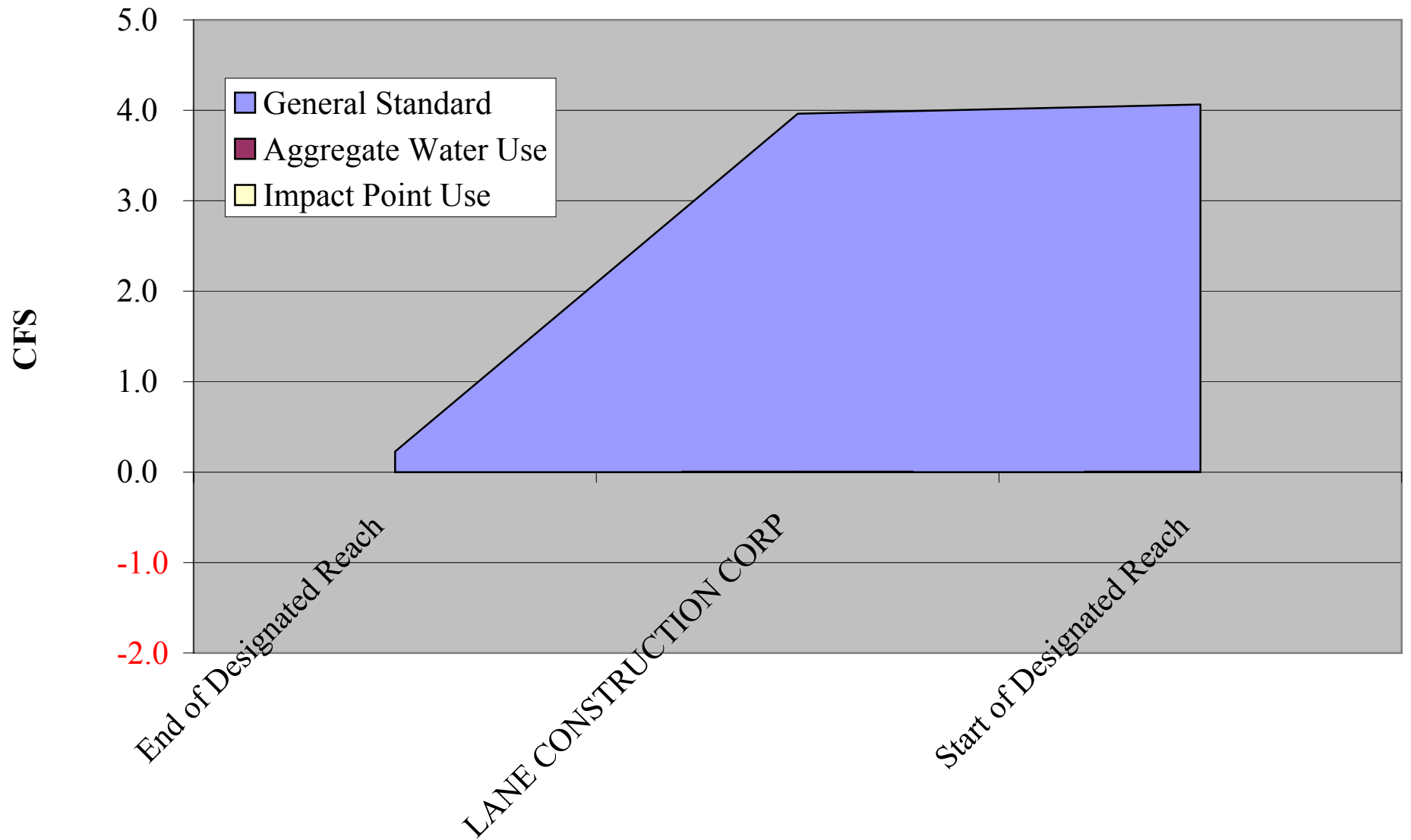
## Cold January 2003



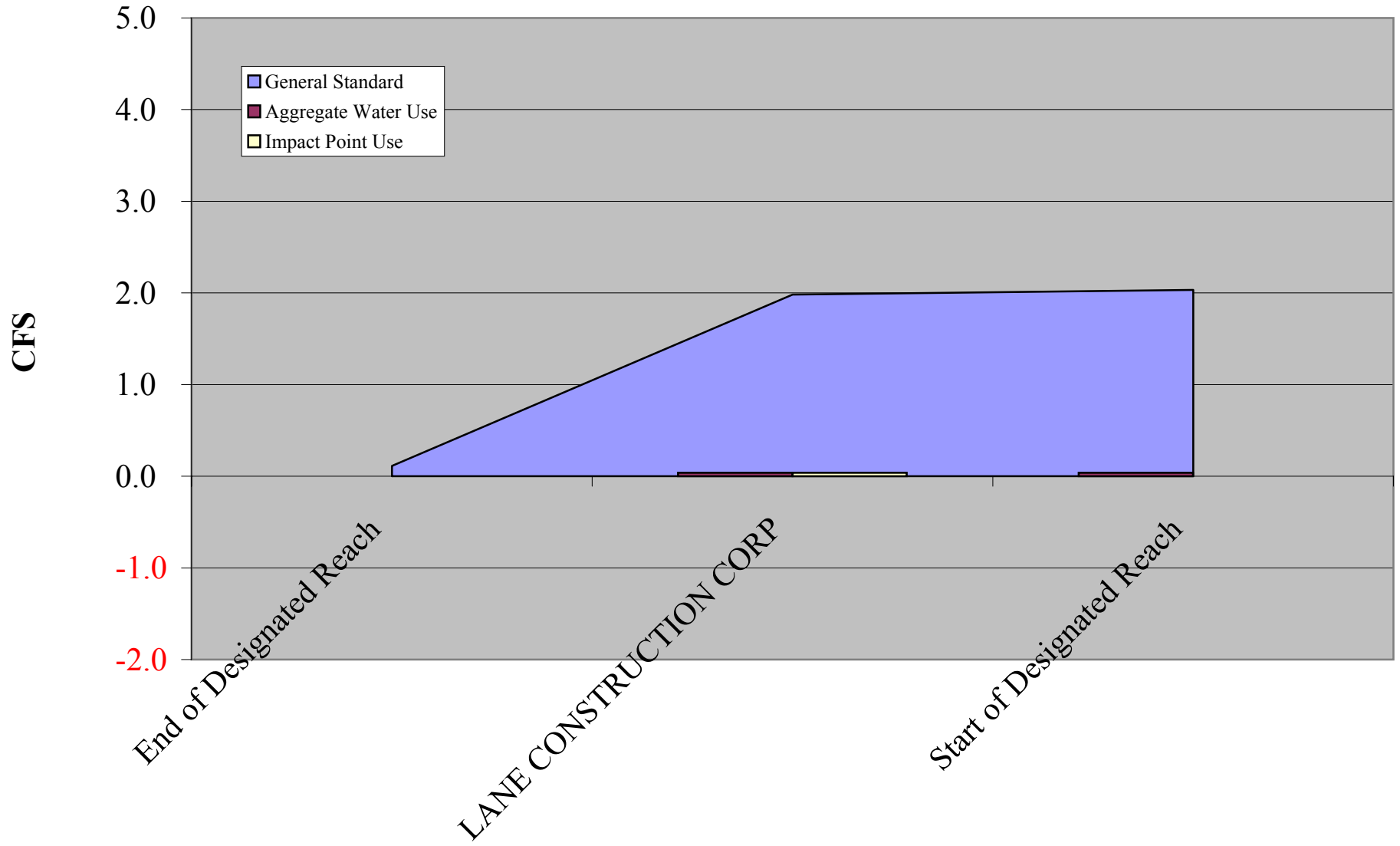
## Cold April 2003



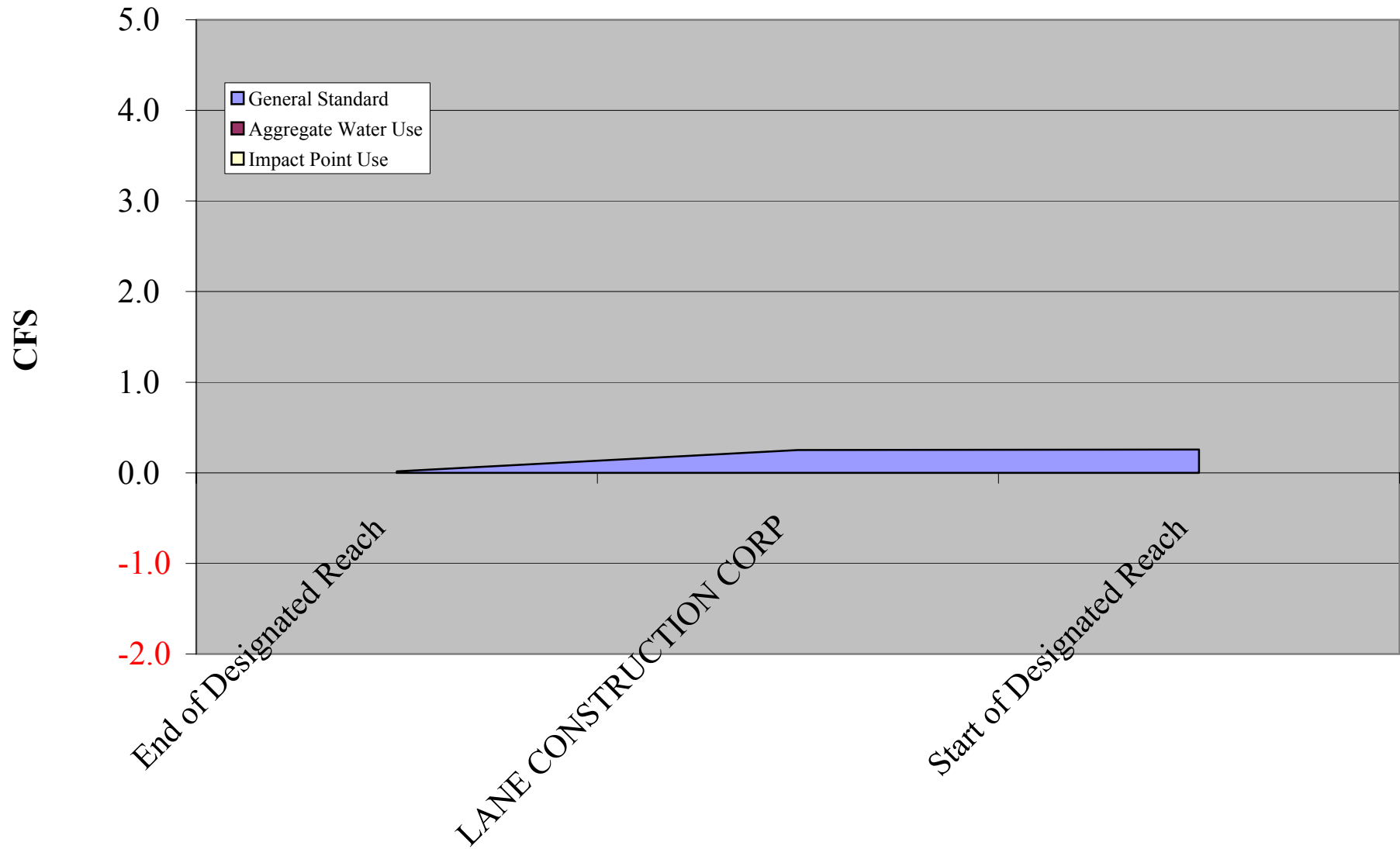
# Cold May 2003



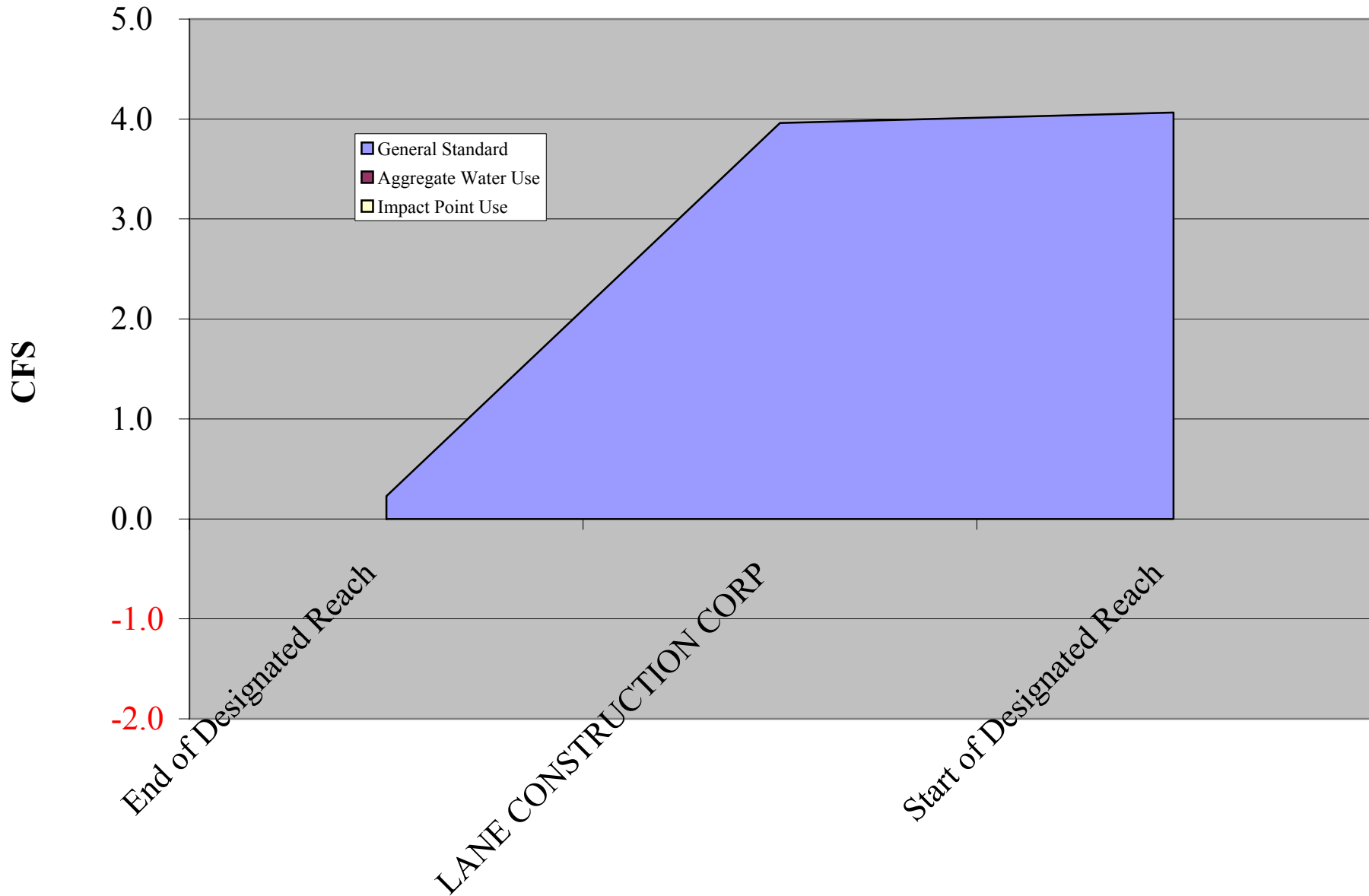
# Cold June 2003



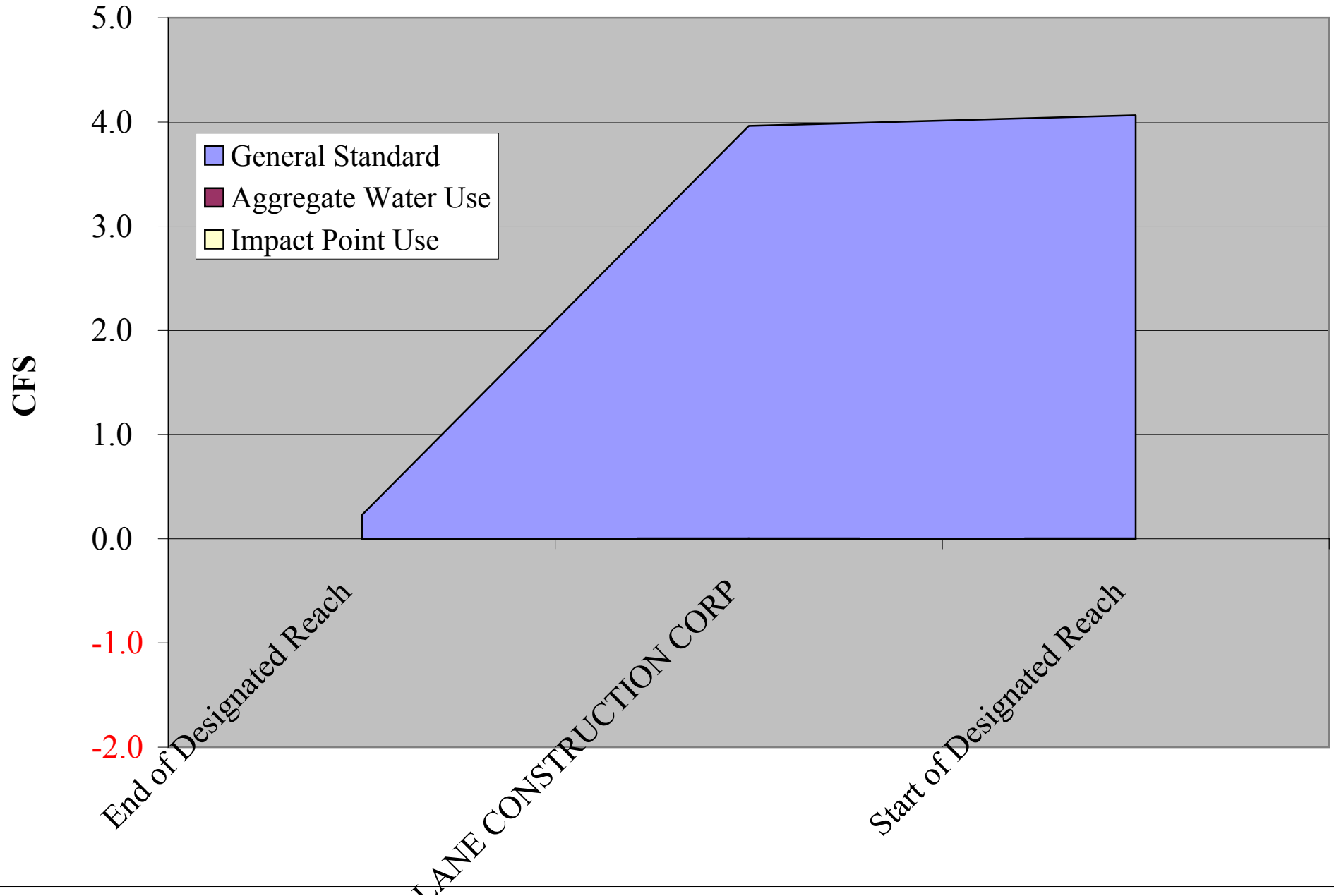
# Cold July 2003



# Cold August 2003

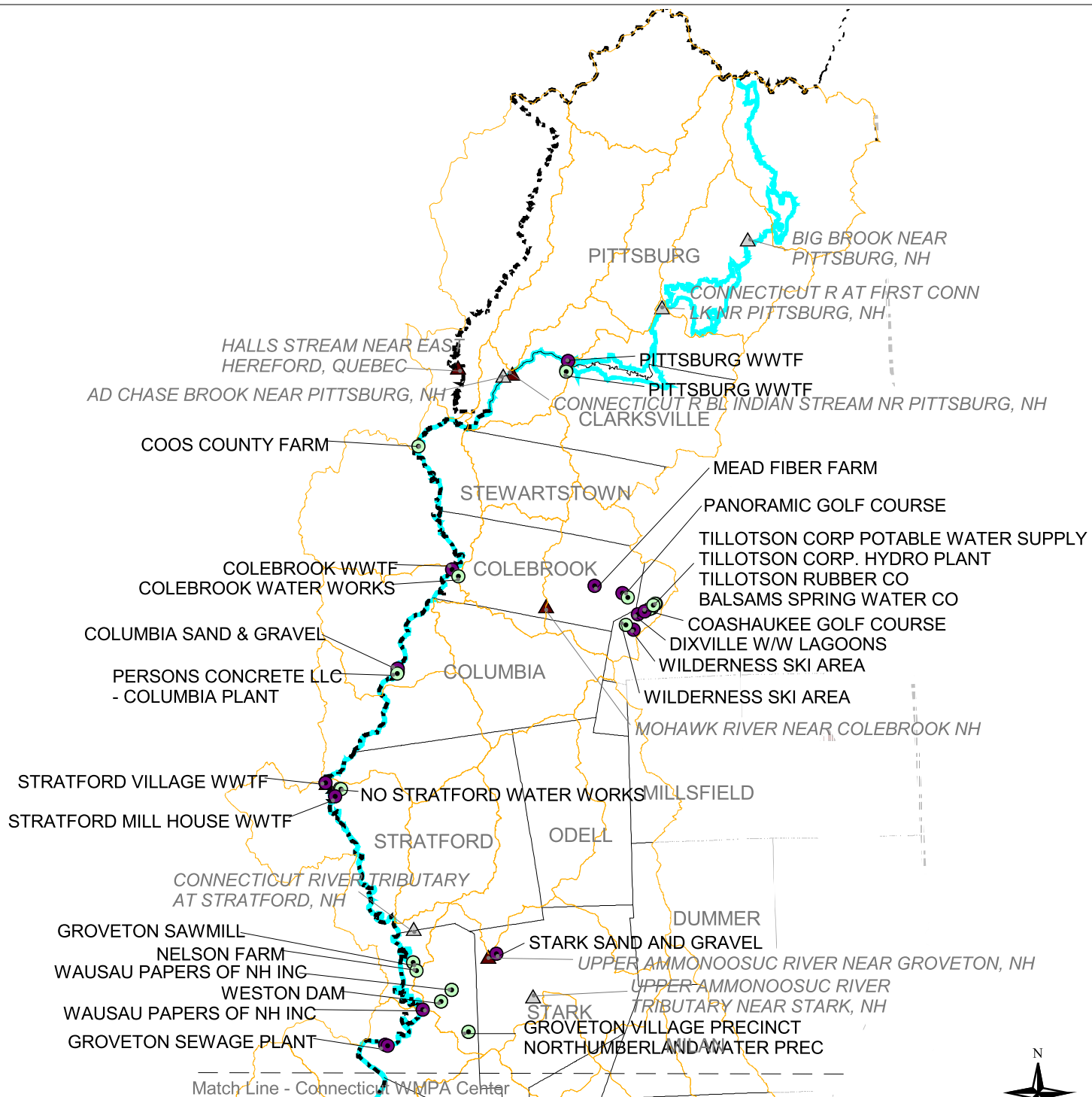


# Cold September 2003





# Connecticut River Affected Water User Facilities: Source and Discharge Locations - North



0 5 10 15 Miles

## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- ▲ Active
- △ Inactive



Designated Reach



Hydrology



State boundary



Town boundary



WMPA

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Map produced March 24, 2004

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# Connecticut River Affected Water User Facilities: Source and Discharge Locations - Center

## Legend

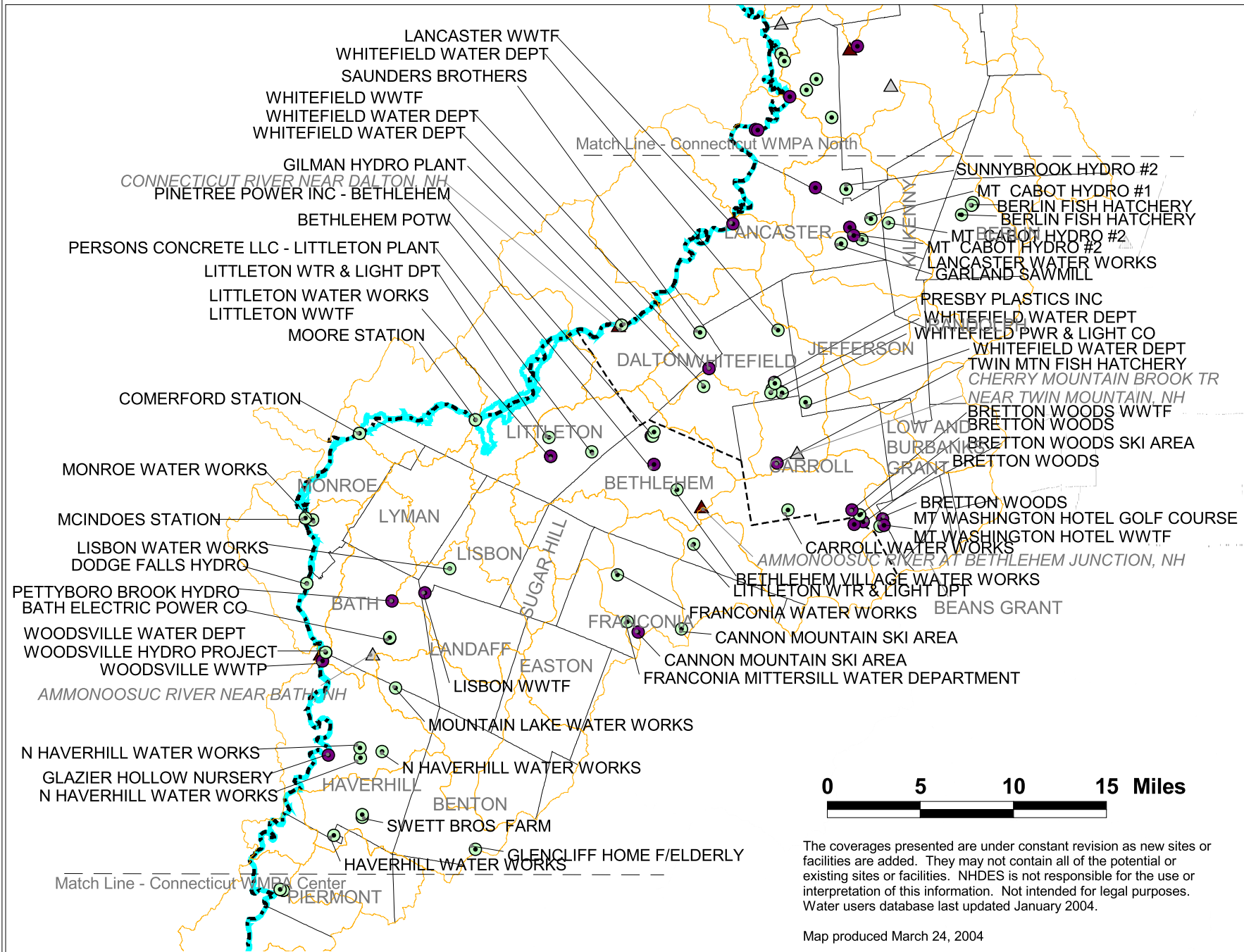
Affected Water Users

- Source
- Discharge

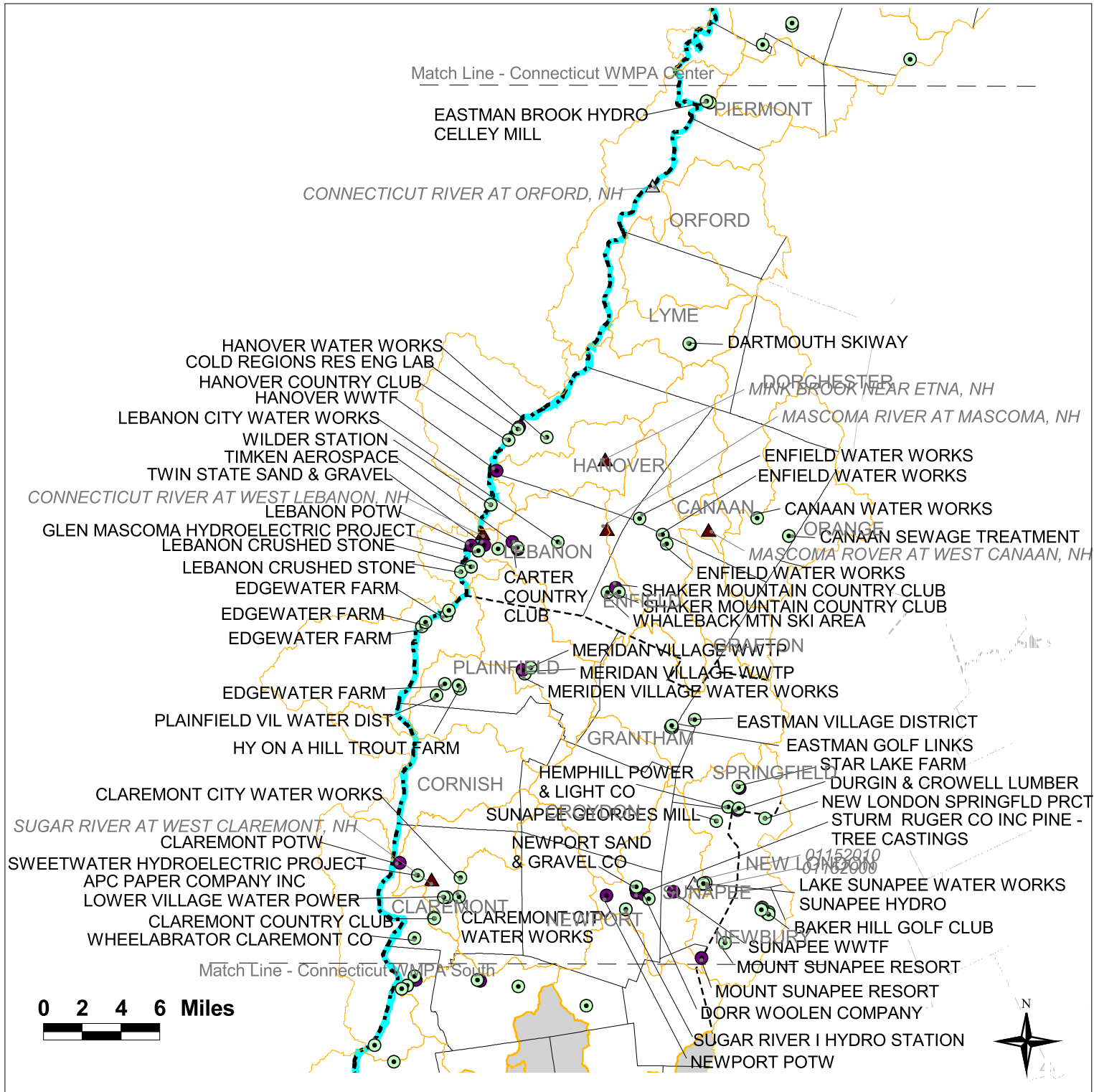
Stream Gages

- ▲ Active
- ▲ Inactive
- ~ Designated Reach
- ~ Hydrology

- State boundary
- Town boundary
- WMPA



# Connecticut River Affected Water User Facilities: Source and Discharge Locations - Center South



## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- ▲ Active
- △ Inactive



Designated Reach



Hydrology



State boundary



Town boundary



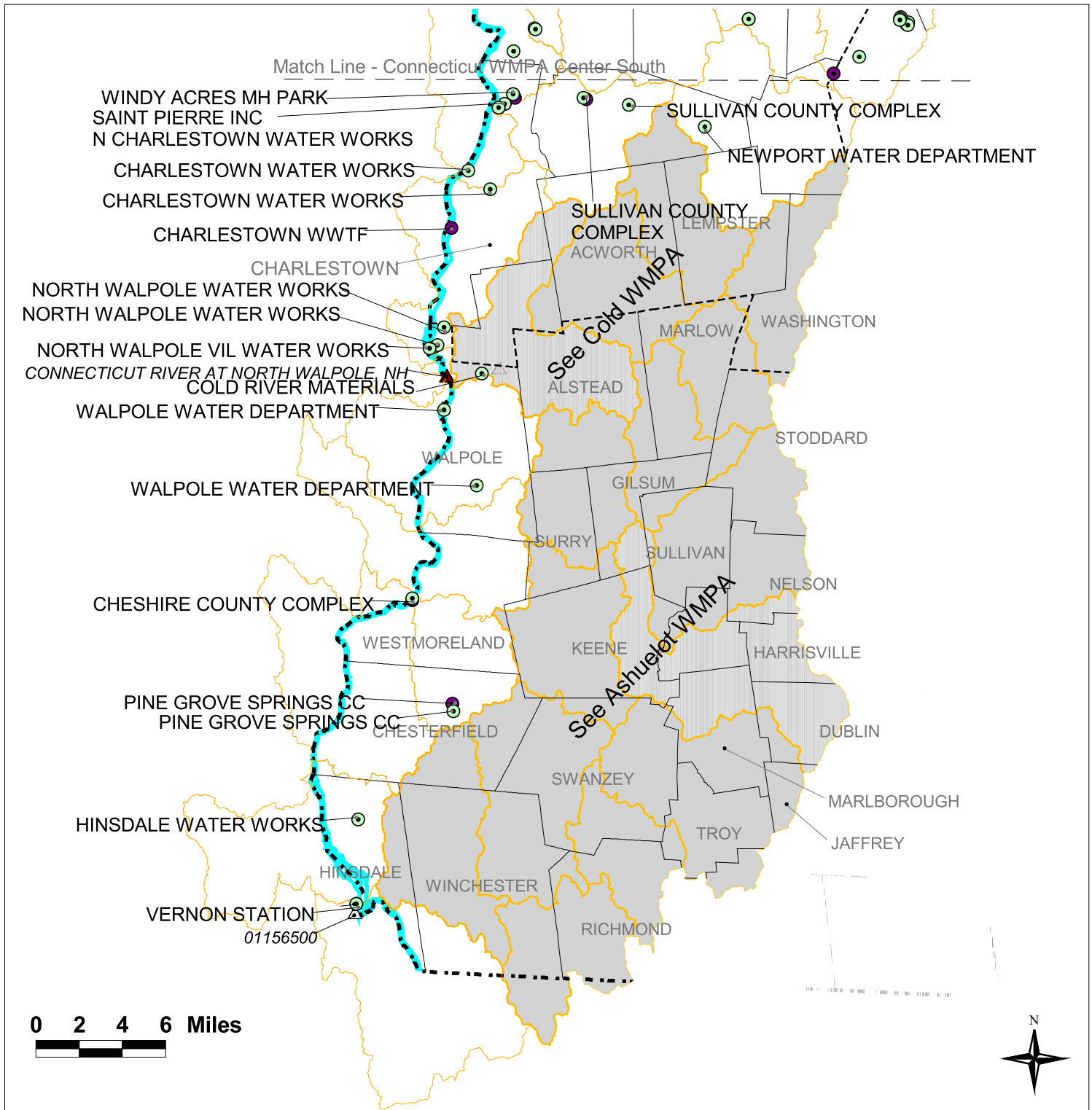
WMPA

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Map produced March 24, 2004

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# Connecticut River Affected Water User Facilities: Source and Discharge Locations - South



## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- Active
- Inactive



Designated Reach



Hydrology



State boundary



Town boundary



WMPA

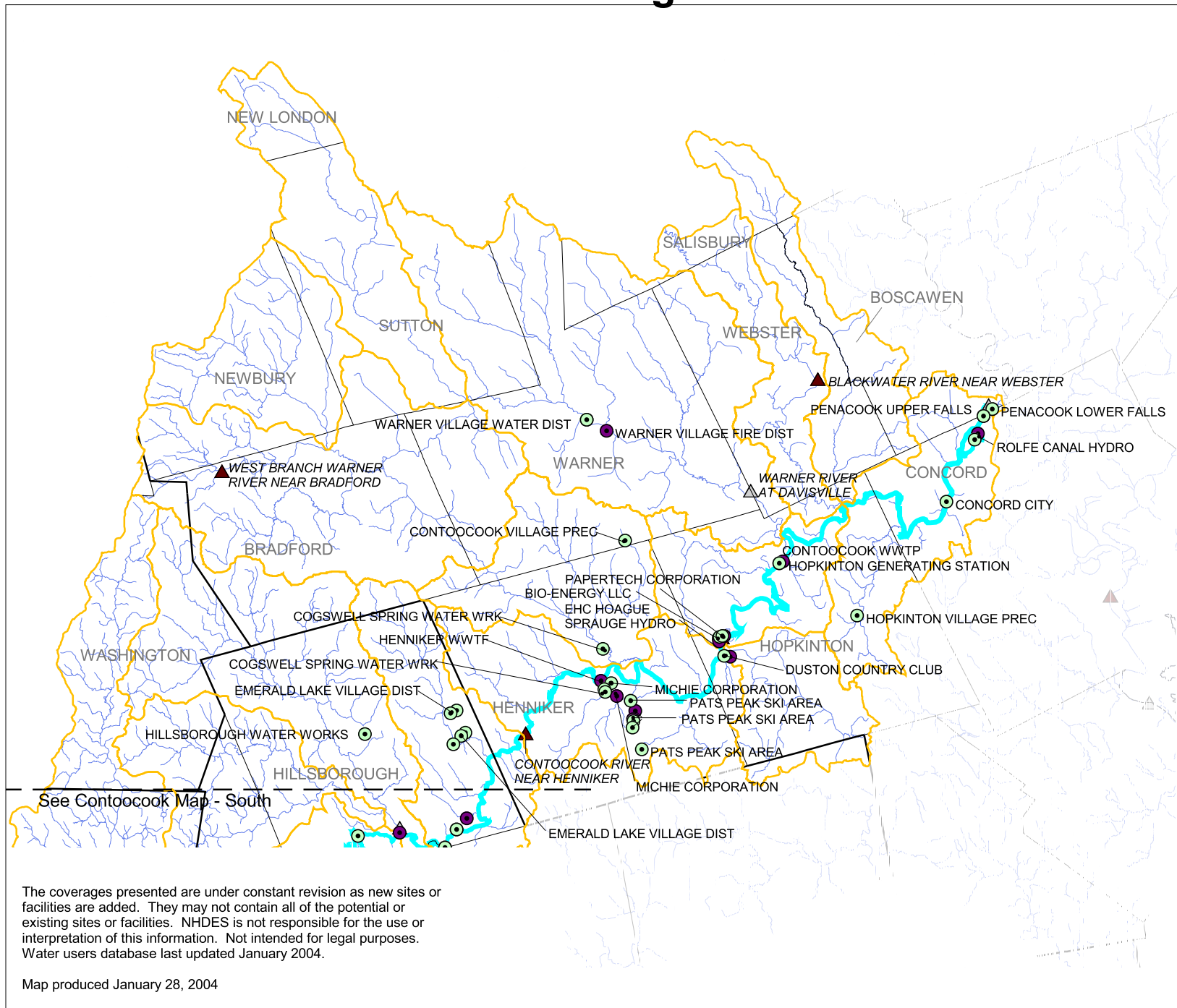
The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced March 24, 2004

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# Contoocook River Affected Water User Facilities: Source and Discharge Locations - North



## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- Active
- Inactive

Designated Reach

Hydrology

State boundary

Town boundary

WMPA

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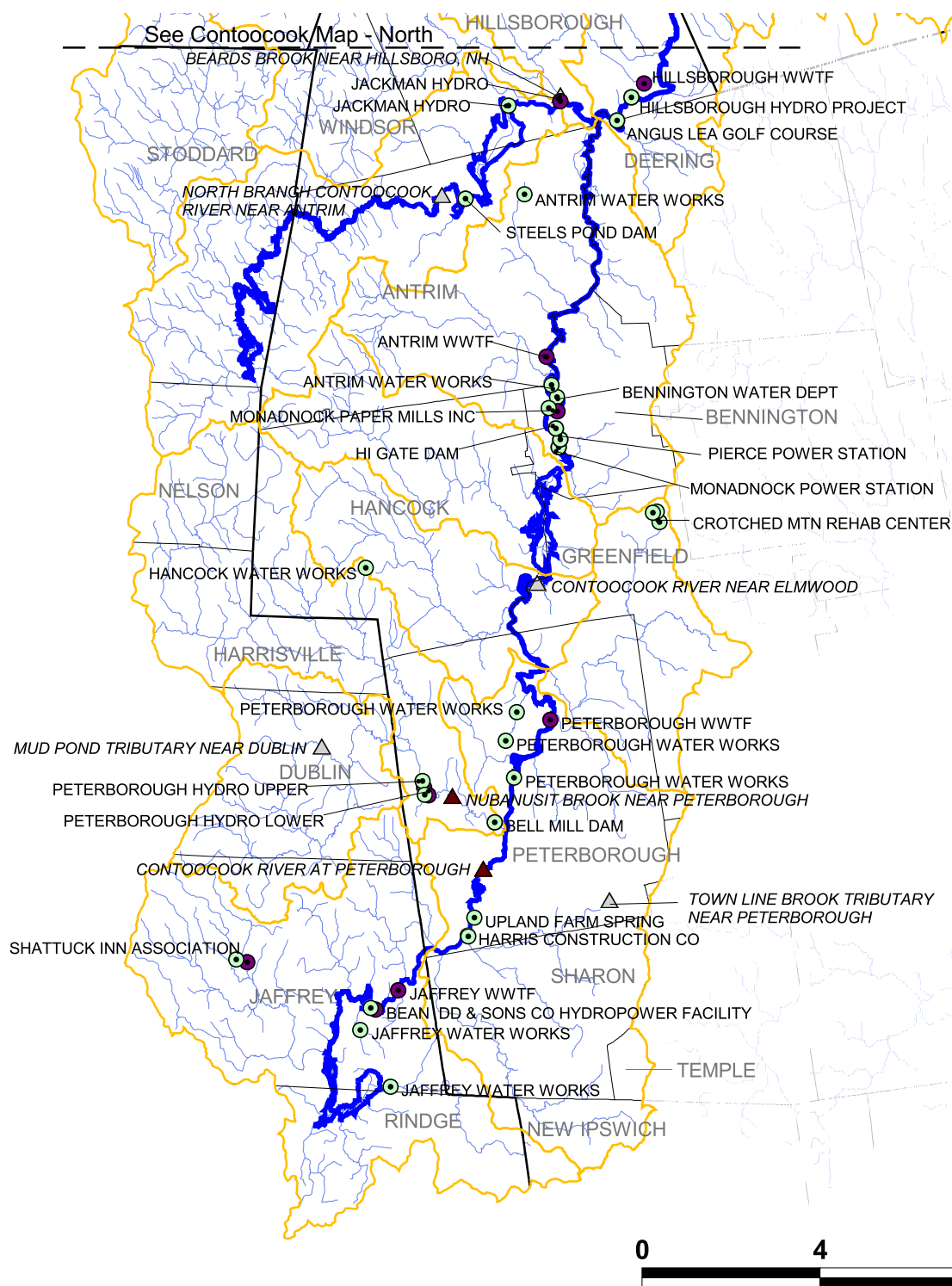
Map produced January 28, 2004

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0 1 2 3 4 Miles

# Contoocook River Affected Water User Facilities: Source and Discharge Locations - South



## Legend

Affected Water Users

Source

Discharge

Stream Gages

Active

Inactive



Designated Reach



Hydrology



State boundary



Town boundary



WMPA

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Map produced January 28, 2004

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## Exeter Annual Water Use versus Stream Flow – Calendar Year 2003

The Exeter Water Management Planning Area covers 76 square miles and includes a streamflow gage in Brentwood (USGS 01073587 EXETER RIVER AT HAIGH ROAD, NEAR BRENTWOOD, NH) measuring 63.5 square miles of the WMPA. For this report the streamflow was transposed areal from the gage to all impact points on the Designated River. There are eight registered sources and no registered, measured returns in the Water Management Planning Area.

A value for 7Q10 at the Exeter gage was estimated by averaging 7Q10 values from the adjacent Lamprey River and nearby Oyster River watershed gages. The value was between the Q95 and Q98 streamflows for the 7-year, period of record date for the Exeter gage, and therefore seems a good estimate.

There were three months in 2003 when the Designated River was not in compliance with the General Standard—July, August and September. In July, the monthly water use the Designated River was not in compliance with the General Standard from the second (downstream-most) J&F Farms source to the start of the Designated Reach at Great Brook in Exeter. In August and September, the Designated River was not in compliance with the General Standard from the confluence with Fordway Brook to Great Brook. The Water Management Planning Area includes agricultural water use with sources at two locations, two industrial (aggregate) facilities each with two source, and two water supply system sources.

# Exeter Affected Water User Facilities: Source and Discharge Locations

## Legend

### Affected Water Users

- Source
- Discharge
- Stream Gages
  - ▲ Active
  - △ Inactive

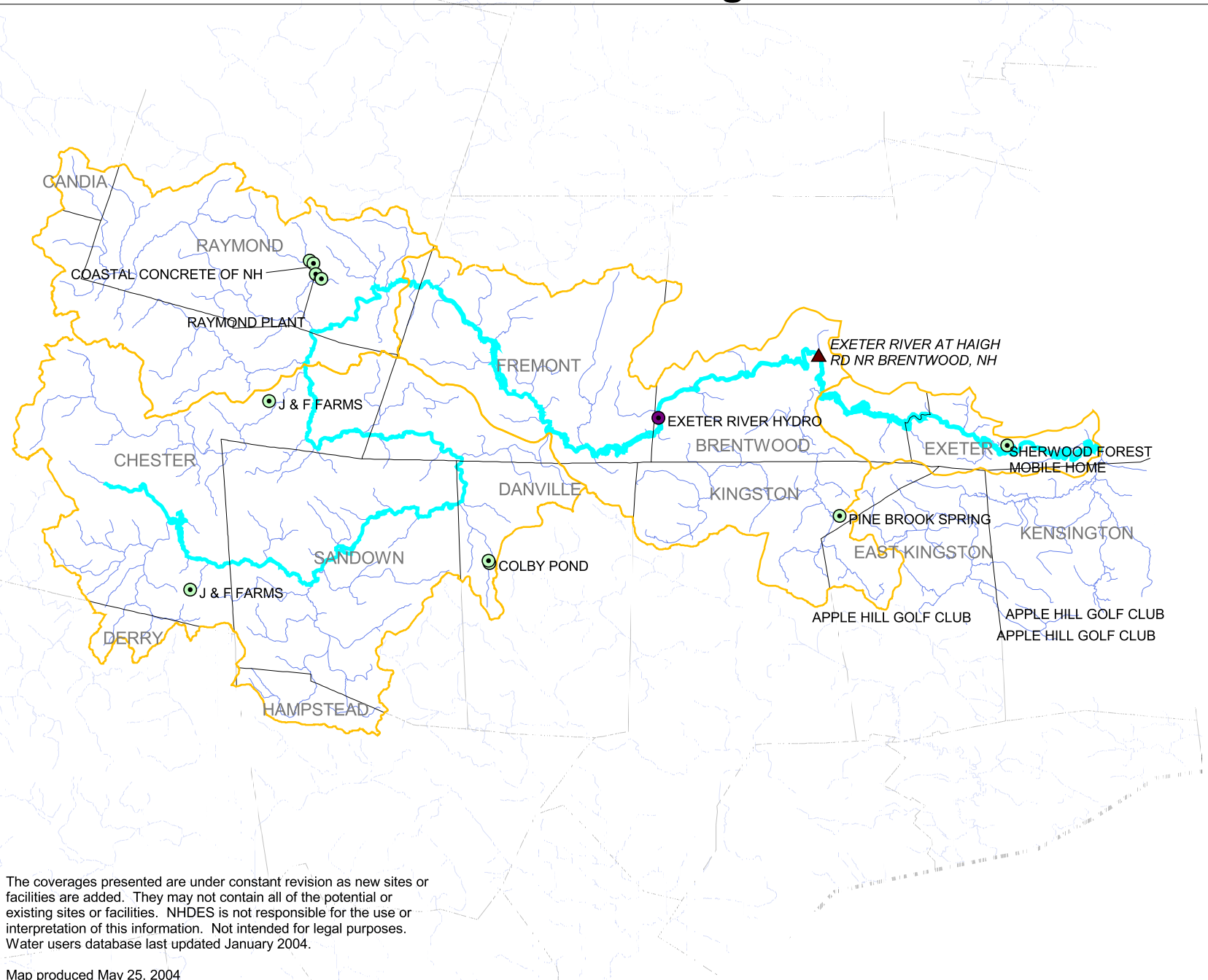
Designated Reach

Hydrology

State boundary

Town boundary

WMPA



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Map produced May 25, 2004

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0 1 2 Miles



## 2003 Exeter Water Use in CFS

WU_NAME	FACILITY	WUSD_ID	DA on DR												
			(SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Beginning Designated Reach	Beginning Designated Reach		0.65												
J&F FARMS INC	J&F FARMS	20637 20637-S03	6.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
J&F FARMS INC	J&F FARMS	20637 20637-S04	31.82	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000
AGGREGATE INDUSTRIES	RAYMOND PLANT	20642 20642-S02	45.16	0.000	0.000	0.000	0.039	0.031	0.045	0.046	0.044	0.005	0.054	0.035	0.013
AGGREGATE INDUSTRIES	RAYMOND PLANT	20642 20642-S01	45.16	0.000	0.000	0.000	0.125	0.101	0.146	0.148	0.141	0.174	0.175	0.111	0.040
AGGREGATE INDUSTRIES	COASTAL CONCRETE OF NH	20641 20641-S02	45.16	0.002	0.004	0.003	0.007	0.006	0.010	0.009	0.008	0.007	0.008	0.006	0.005
AGGREGATE INDUSTRIES	COASTAL CONCRETE OF NH	20641 20641-S01	45.16	0.002	0.004	0.003	0.007	0.006	0.010	0.009	0.008	0.007	0.008	0.006	0.005
PINE BROOK SPRING WATER	PINE BROOK SPRING	20631 20631-S01	72.14	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.000	0.000	0.003	0.000
SHERWOOD FOREST MBLE HOME	SHERWOOD FOREST MBLE HOME	20468 20468-S01	75.34	0.041	0.041	0.041	0.051	0.007	0.056	0.054	0.062	0.058	0.118	0.044	0.046

## 2003 Exeter Aggregate Water Use in CFS

WU_NAME	FACILITY	WUSD_ID	DA on DR													
			(SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Beginning Designated Reach	Beginning Designated Reach		0.65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
J&F FARMS INC	J&F FARMS	20637 20637-S03	6.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
J&F FARMS INC	J&F FARMS	20637 20637-S04	31.82	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000
Fordway Brook confluence			45.16	0.004	0.007	0.006	0.179	0.144	0.211	0.248	0.202	0.194	0.245	0.159	0.062	
PINE BROOK SPRING WATER	PINE BROOK SPRING	20631 20631-S01	72.14	0.004	0.007	0.006	0.179	0.145	0.211	0.248	0.205	0.194	0.245	0.161	0.062	
SHERWOOD FOREST MBLE HOME	SHERWOOD FOREST MBLE HOME	20468 20468-S01	75.34	0.045	0.048	0.047	0.230	0.152	0.267	0.302	0.266	0.253	0.363	0.205	0.109	
End Designated Reach Confluence Exeter and	End Designated Reach Confluence Exeter and Squamsco		76.35	0.045	0.048	0.047	0.230	0.152	0.267	0.302	0.266	0.253	0.363	0.205	0.109	

#### 4. Table of Estimated Monthly Stream Flows and General Standard Values

### USGS 01073587 EXETER RIVER AT HAIGH ROAD, NEAR BRENTWOOD, NH

DA(mi^2) 63.5

7Q10 (cfs) 1.3 \*

	Mean of daily streamflows (2003) in cfs	Mean of monthly streamflows (POR) in ft3/s	Median of monthly means (cfs)	Calculated 2003 monthly mean streamflow	General Standard in cfsm
Jan-03	89	88.8	100	1.40	0.04
Feb-03	128	130	123	2.01	0.04
Mar-03	284	237	239	4.47	0.16
Apr-03	240	206	197	3.78	0.04
May-03	112	113	132	1.77	0.04
Jun-03	78	107	64	1.23	0.04
Jul-03	9	27.8	19	0.14	0.0010
Aug-03	24	7.58	4	0.39	0.0010
Sep-03	13	13.1	4	0.21	0.0010
Oct-03	49	73.4	22	0.77	0.02
Nov-03	86	56.9	50	1.35	0.04
Dec-03	152	98	68	2.39	0.04

2003 daily data availability

75.3% = number of days with data in 2003 / 365 days

Using POR average streamflow for this month

Using interpolated values or POR average daily

\* Determined by averaging the Lamprey and Oyster River gages.

**2003 Exeter Estimated Monthly Stream Flow at Each Impact Point in CFS**

WU_NAME	FACILITY	WUSD_ID	(SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Beginning Designated Reach	Beginning Designated Reach		0.65	0.903323	1.29664	2.88611	2.435426	1.140746	0.794764	0.091135	0.248664	0.134741	0.498769	0.873327	1.54317
J&F FARMS INC	J&F FARMS	20637 20637-S03	6.05	8.466565	12.153	27.05062	22.8265	10.69186	7.449082	0.854182	2.330647	1.262884	4.674809	8.185421	14.4637
J&F FARMS INC	J&F FARMS	20637 20637-S04	31.82	44.56162	63.9642	142.3741	120.1415	56.2739	39.20636	4.495769	12.26677	6.646873	24.60467	43.08189	76.1258
Fordway Brook confluence			45.16	63.24223	90.7785	202.0585	170.5059	79.8644	55.642	6.380433	17.40911	9.433298	34.91916	61.14219	108.038
PINE BROOK SPRING WATER	PINE BROOK SPRING	20631 20631-S01	72.14	101.011	144.992	322.7296	272.3334	127.5601	88.87187	10.19088	27.80597	15.06694	55.77319	97.65682	172.56
SHERWOOD FOREST MBLE HOME	SHERWOOD FOREST MBLE HOME	20468 20468-S01	75.34	105.4979	151.433	337.0651	284.4303	133.2262	92.81951	10.64356	29.0411	15.73621	58.2506	101.9947	180.225
End Designated Reach Confluence Exeter and Squamscot			76.35	106.9133	153.464	341.5872	288.2463	135.0136	94.0648	10.78635	29.43072	15.94733	59.03211	103.3631	182.643

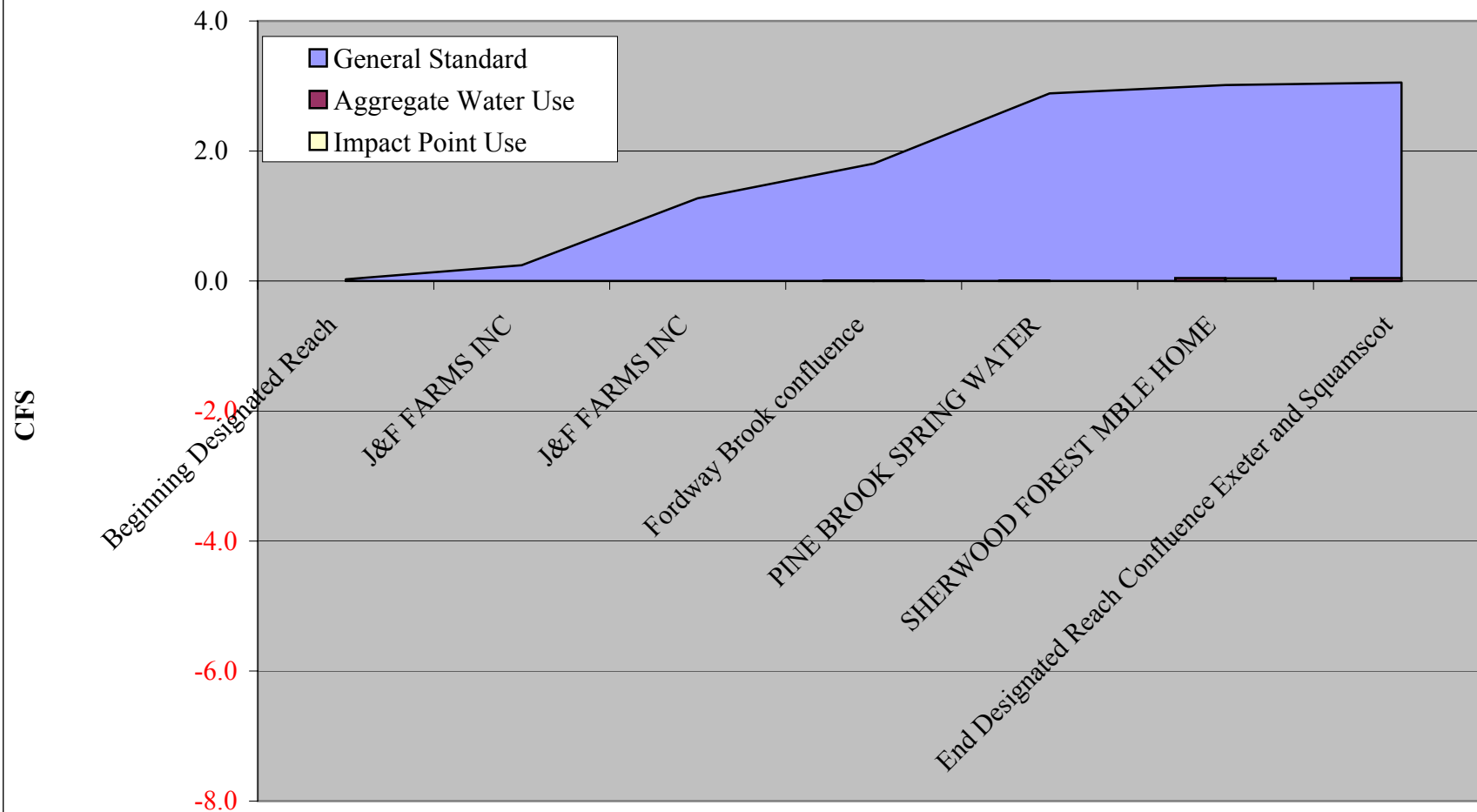
2003 Exeter Estimated Monthly General Standard at Each Impact Point in CFS

2003 Exeter Estimated Monthly General Standard at Each Impact Point in CFS			General Standard in cfs/m												
			0.04	0.04	0.16	0.04	0.04	0.04	0.0010	0.0010	0.0010	0.02	0.04	0.04	
			DA on DR												
WU_NAME	FACILITY	WUSD_ID	(SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Beginning Designated Reach	Beginning Designated Reach		0.65	0.026	0.026	0.103	0.026	0.026	0.026	0.001	0.001	0.001	0.013	0.026	0.026
J&F FARMS INC	J&F FARMS	20637 20637-S03	6.05	0.242	0.242	0.967	0.242	0.242	0.242	0.006	0.006	0.006	0.121	0.242	0.242
J&F FARMS INC	J&F FARMS	20637 20637-S04	31.82	1.273	1.273	5.092	1.273	1.273	1.273	0.033	0.033	0.033	0.636	1.273	1.273
Fordway Brook confluence			45.16	1.807	1.807	7.226	1.807	1.807	1.807	0.046	0.046	0.046	0.903	1.807	1.807
PINE BROOK SPRING WATER	PINE BROOK SPRING	20631 20631-S01	72.14	2.885	2.885	11.542	2.885	2.885	2.885	0.074	0.074	0.074	1.443	2.885	2.885
SHERWOOD FOREST MBL HOME	SHERWOOD FOREST MBL HOME	20468 20468-S01	75.34	3.014	3.014	12.054	3.014	3.014	3.014	0.077	0.077	0.077	1.507	3.014	3.014
End Designated Reach Confluence Exeter and Squamscot	End Designated Reach Confluence Exeter and Squamscot		76.35	3.054	3.054	12.216	3.054	3.054	3.054	0.078	0.078	0.078	1.527	3.054	3.054

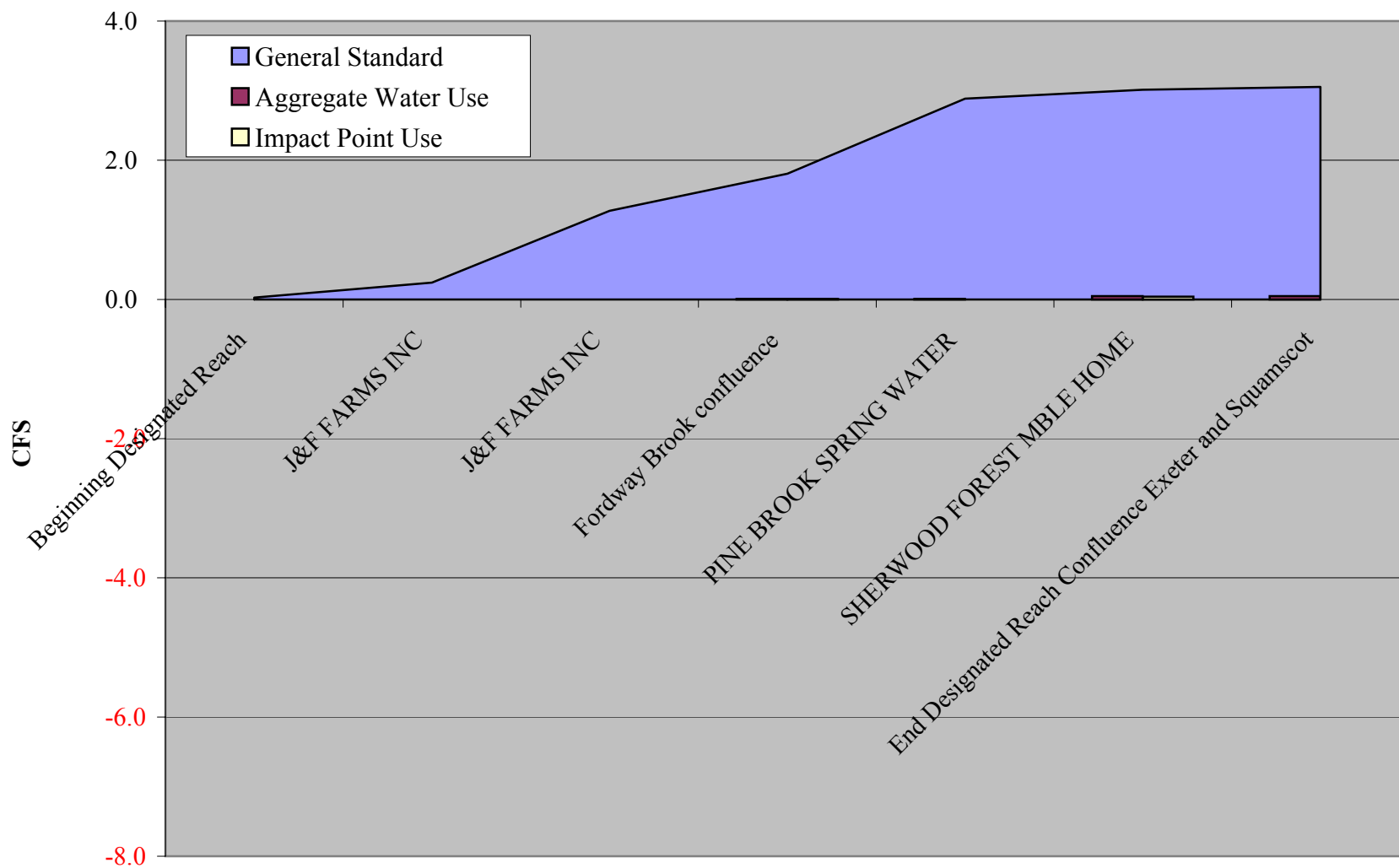
**2003 Exeter Estimated Monthly Margin of the Aggregate  
Water Use Below the General Standard**

WU_NAME	FACILITY	WUSD_ID	DA on DR (SQ MILE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Beginning Designated Reach	Beginning Designated Reach		0.65	0.026	0.026	0.103	0.026	0.026	0.026	0.001	0.001	0.001	0.013	0.026	0.026
J&F FARMS INC	J&F FARMS	20637 20637-S03	6.05	0.242	0.242	0.967	0.242	0.242	0.242	0.006	0.006	0.006	0.121	0.242	0.242
J&F FARMS INC	J&F FARMS	20637 20637-S04	31.82	1.273	1.273	5.092	1.273	1.273	1.273	(0.003)	0.033	0.033	0.636	1.273	1.273
Fordway Brook confluence			45.16	1.802	1.799	7.220	1.628	1.662	1.595	(0.201)	(0.156)	(0.148)	0.658	1.648	1.744
PINE BROOK SPRING WATER	PINE BROOK SPRING	20631 20631-S01	72.14	2.881	2.878	11.535	2.707	2.741	2.674	(0.174)	(0.130)	(0.120)	1.197	2.724	2.823
SHERWOOD FOREST MBLE HOME	SHERWOOD FOREST MBLE HOME	20468 20468-S01	75.34	2.969	2.965	12.007	2.783	2.862	2.747	(0.224)	(0.189)	(0.175)	1.143	2.808	2.905
End Designated Reach Confluence Exeter and	End Designated Reach Confluence Exeter and Squamscot		76.35	3.009	3.006	12.169	2.824	2.902	2.787	(0.223)	(0.188)	(0.174)	1.164	2.849	2.945

## January 2003 Exeter

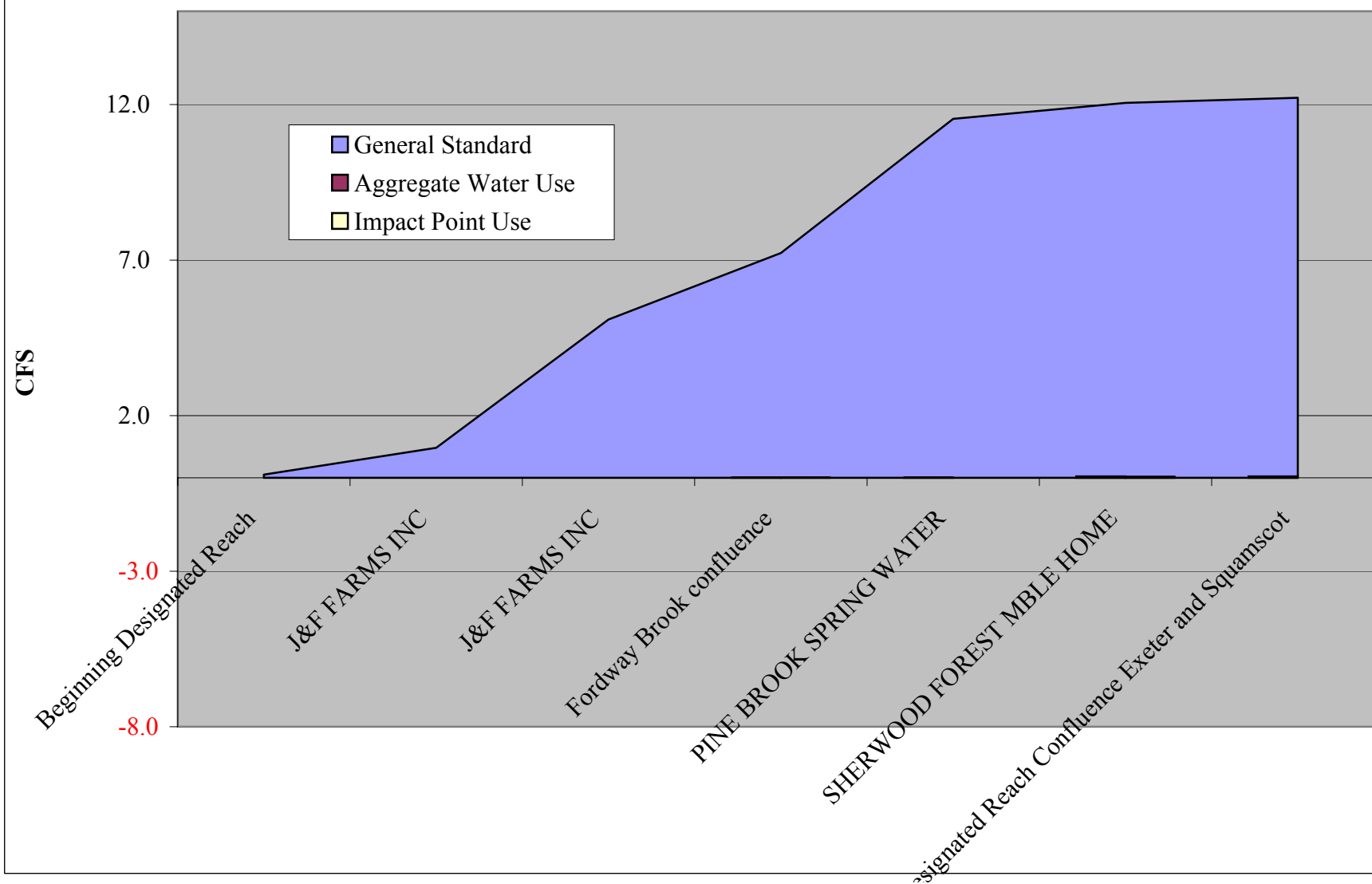


## February 2003 Exeter

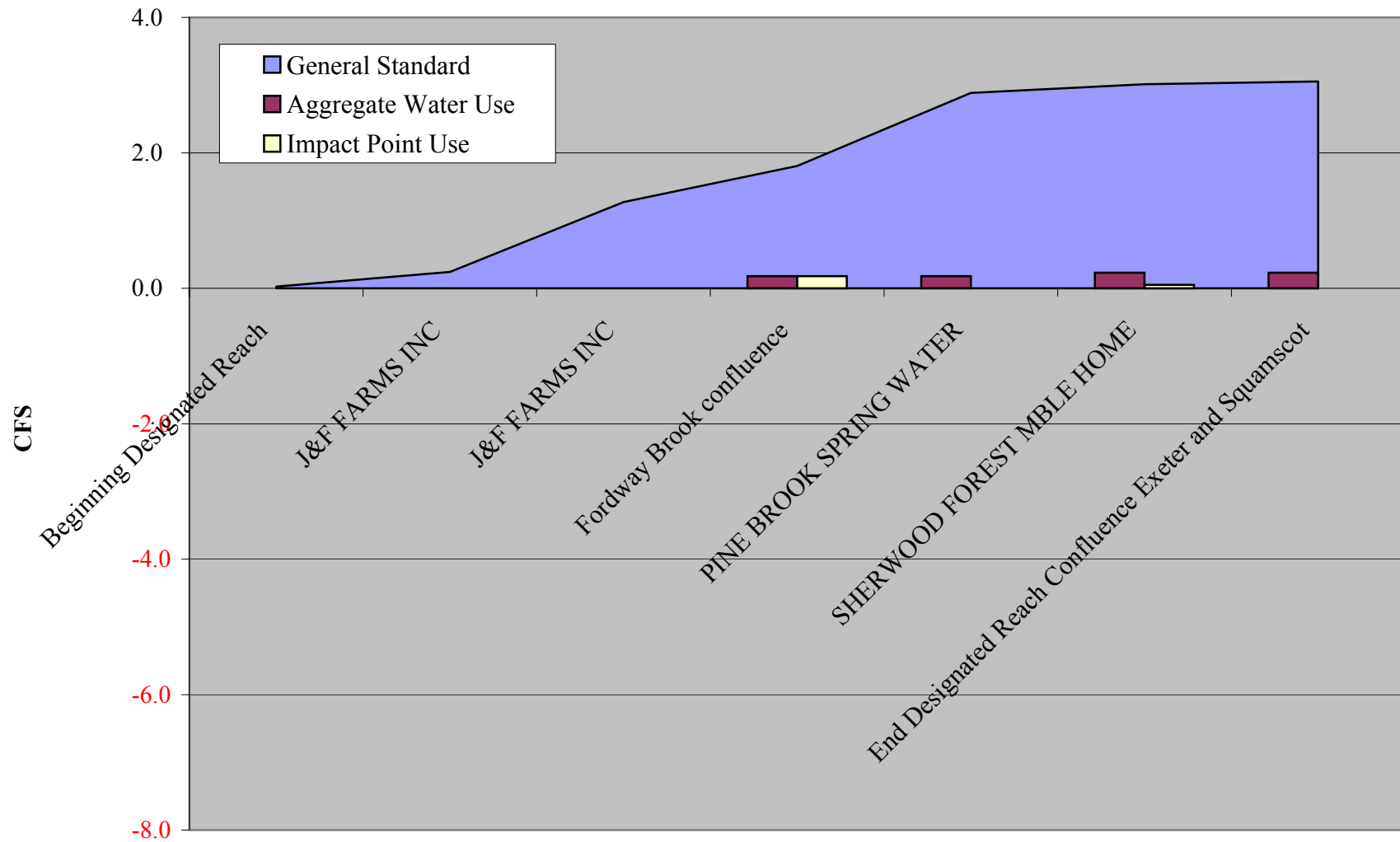




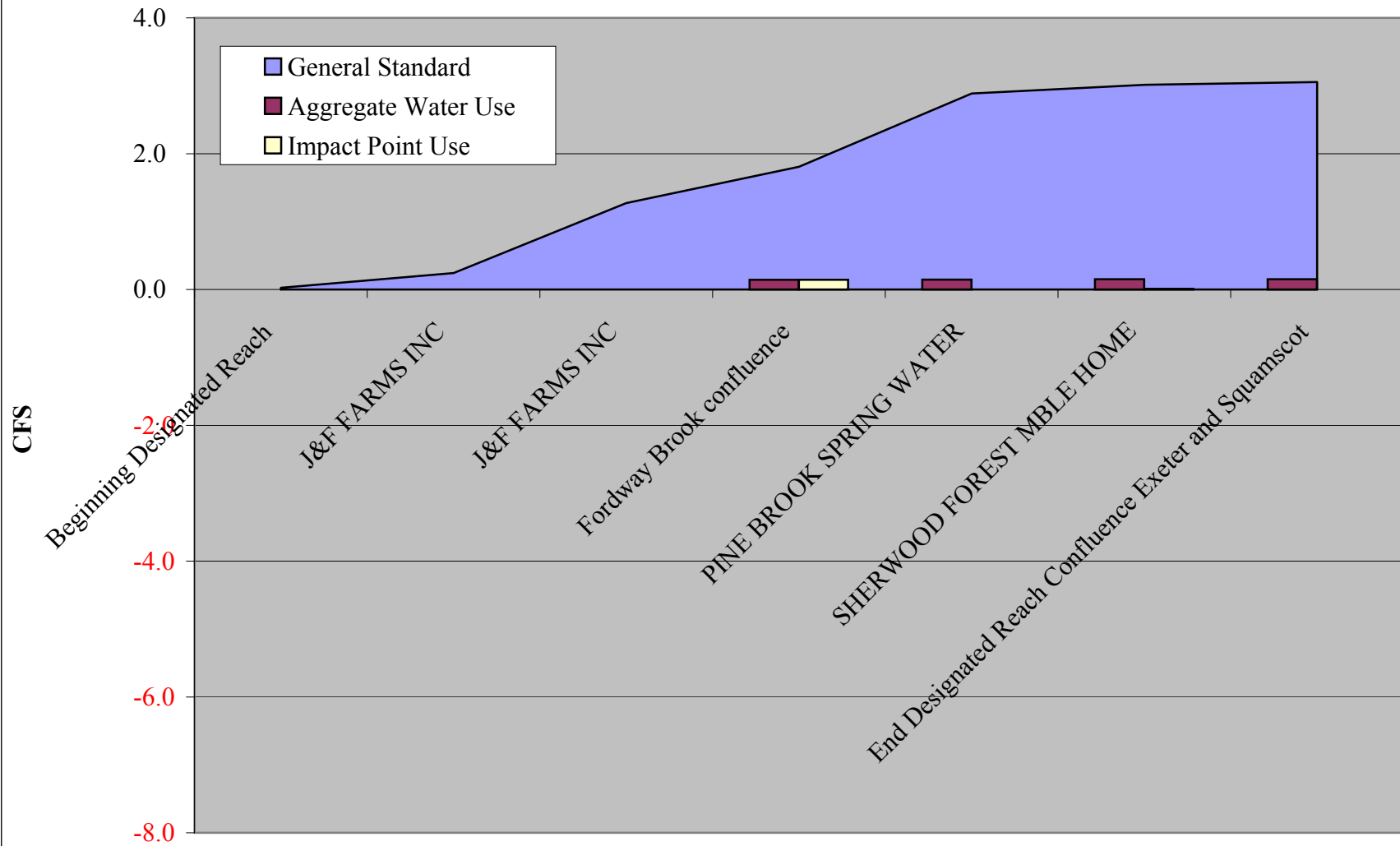
## March 2003 Exeter



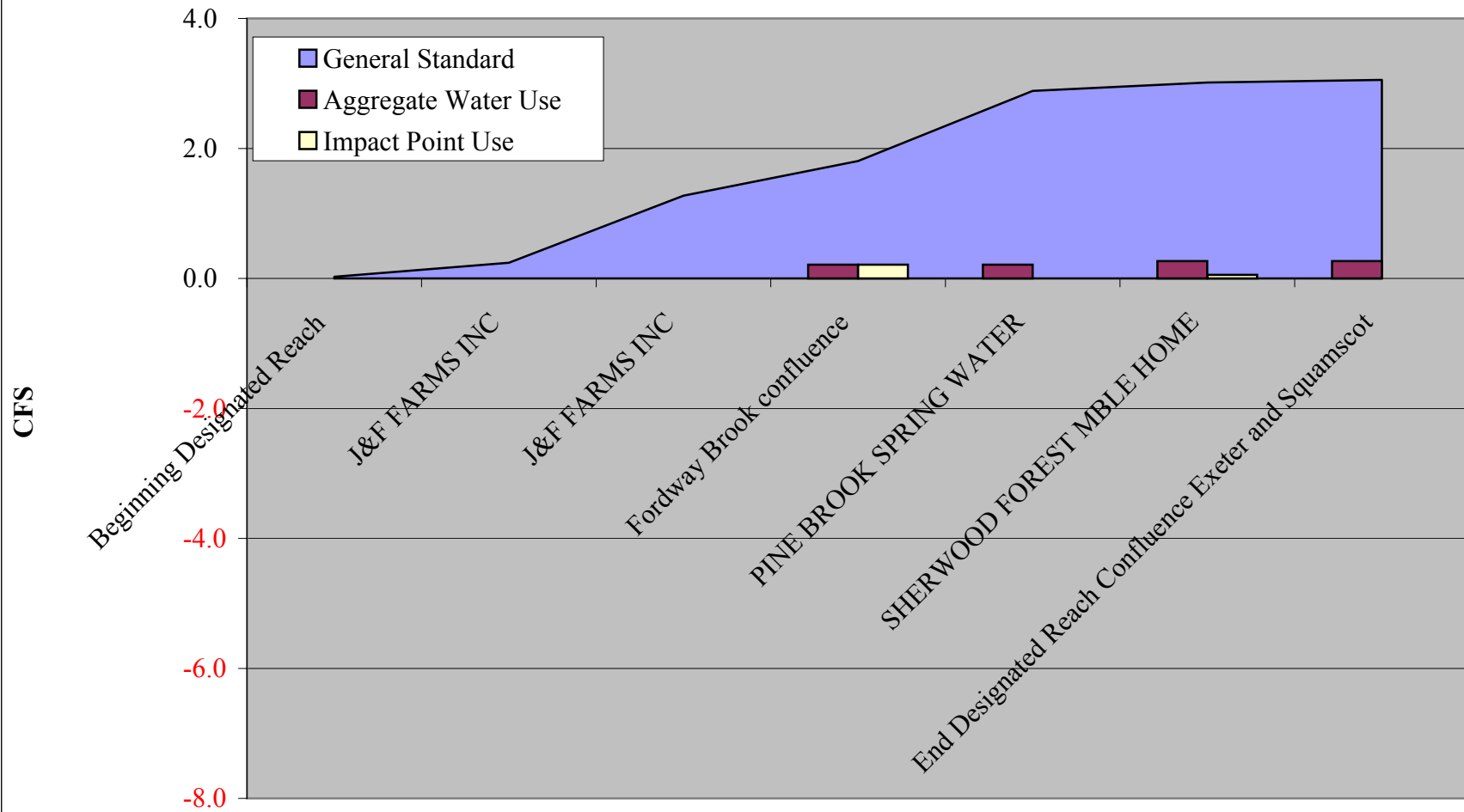
## April 2003 Exeter



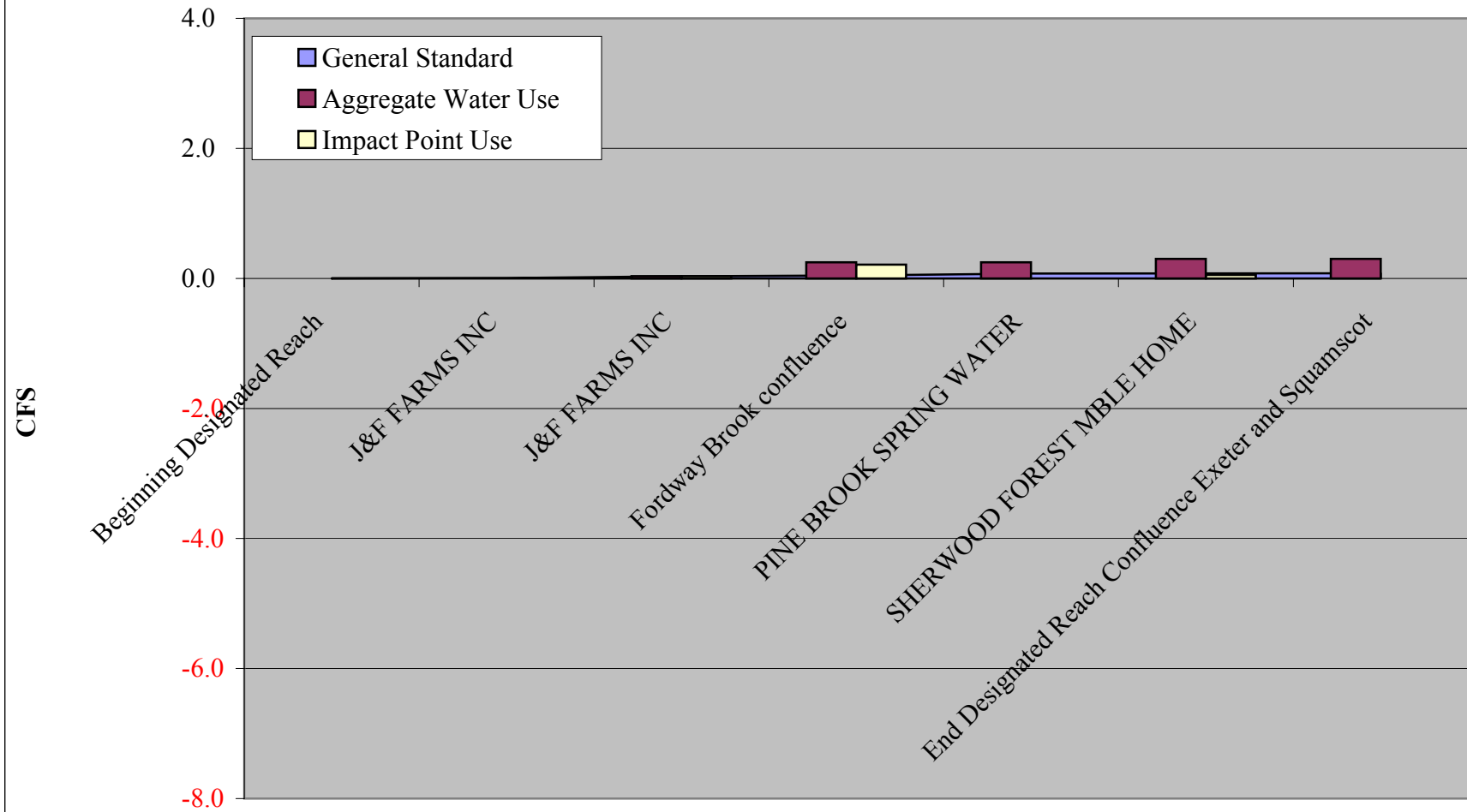
## May 2003 Exeter



## June 2003 Exeter



## July 2003 Exeter



# Isinglass River Affected Water User Facilities: Source and Discharge Locations

## Legend

### Affected Water Users

● Source

● Discharge

Stream Gages

▲ Active

△ Inactive

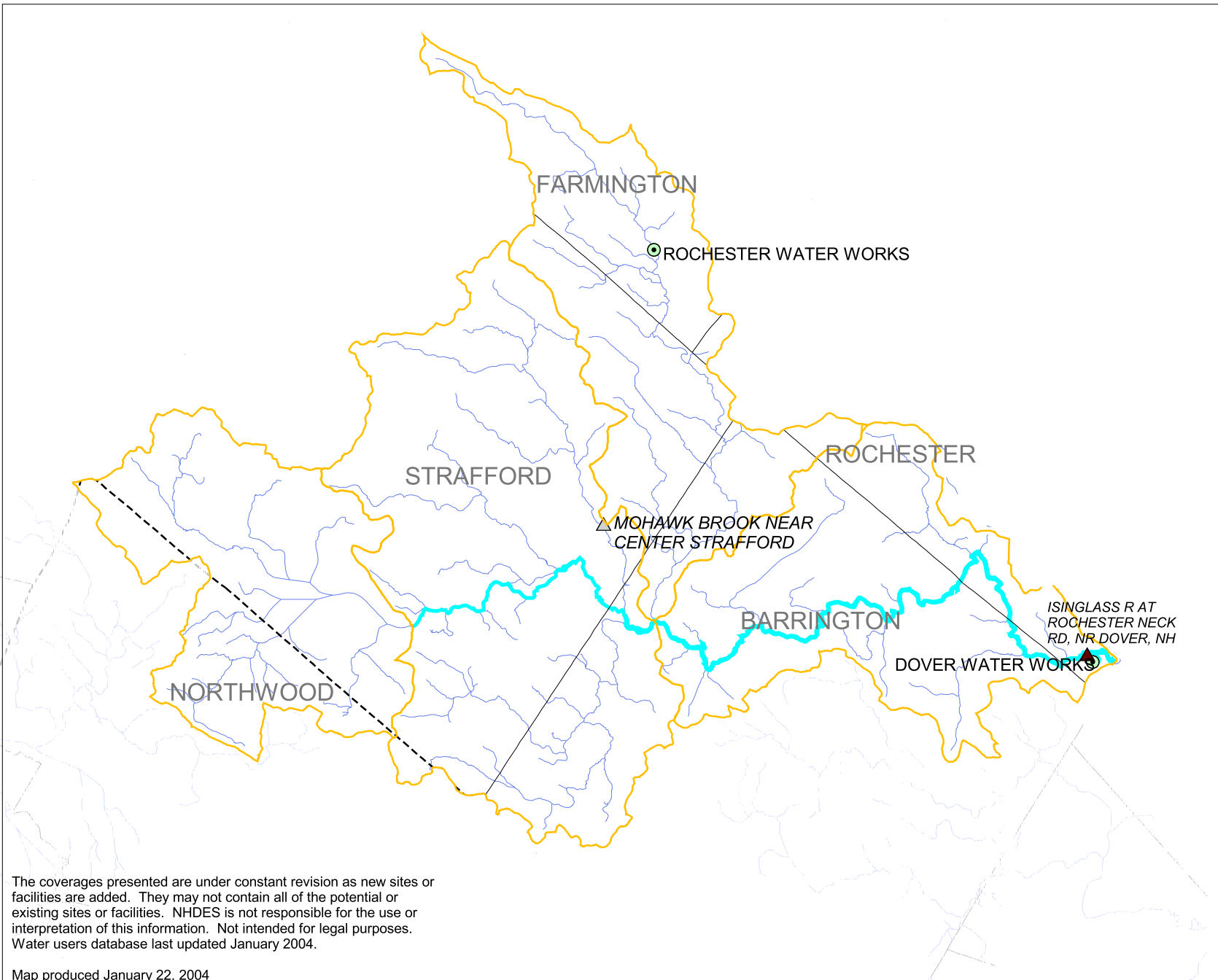
Designated Reach

Hydrology

State boundary

Town boundary

WMPA



The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

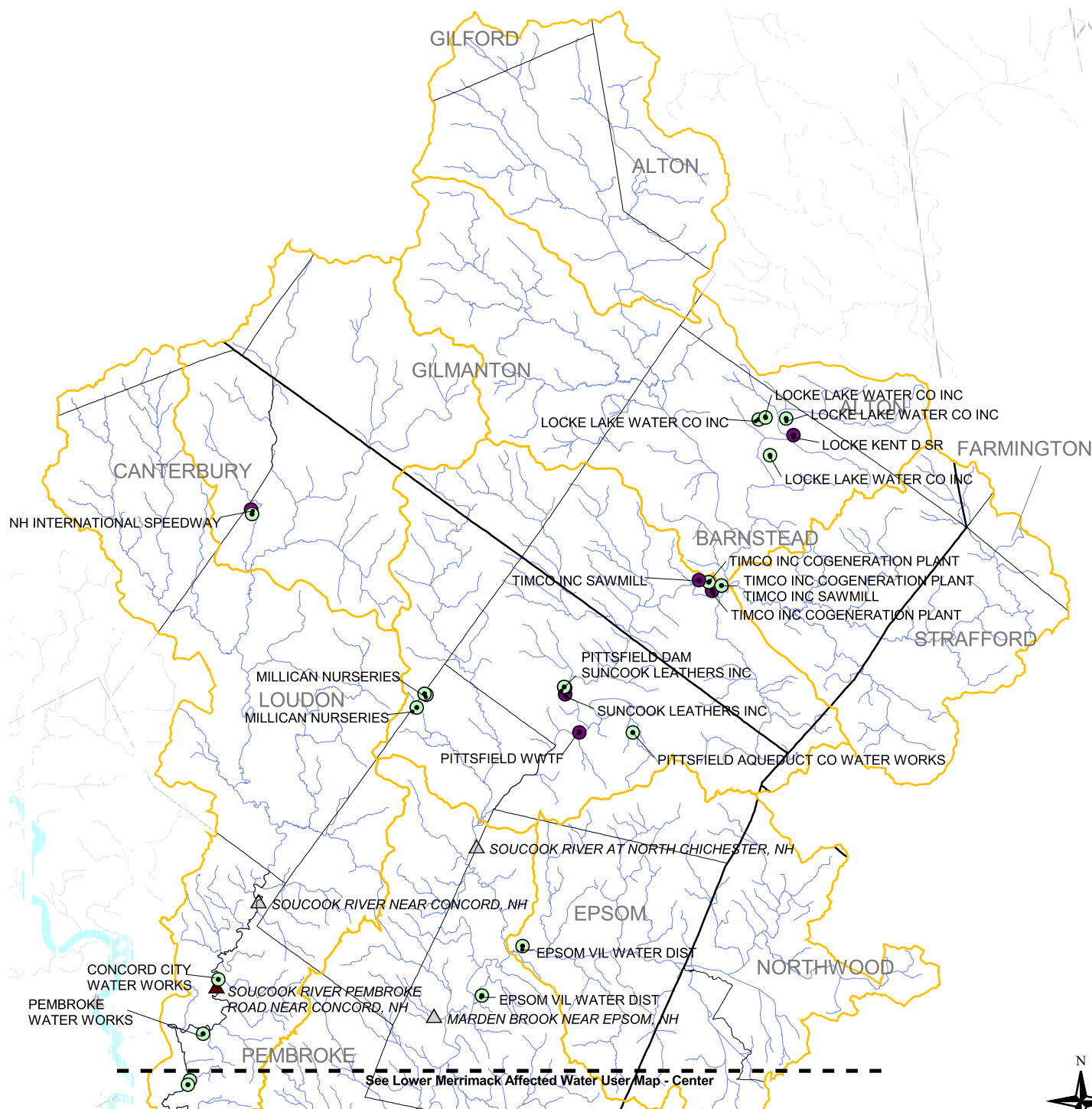
Map produced January 22, 2004

h:\water quality\instream flow\gisprojects\wmpa\isinglass\_waterquality.apr



0 1 2 Miles

# Lower Merrimack River Affected Water User Facilities: Source and Discharge Locations - North



0 1 2 3 4 5 Miles

## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- ▲ Active
- △ Inactive
- △ Unknown



Designated Reach



Hydrology



State boundary



Town boundary



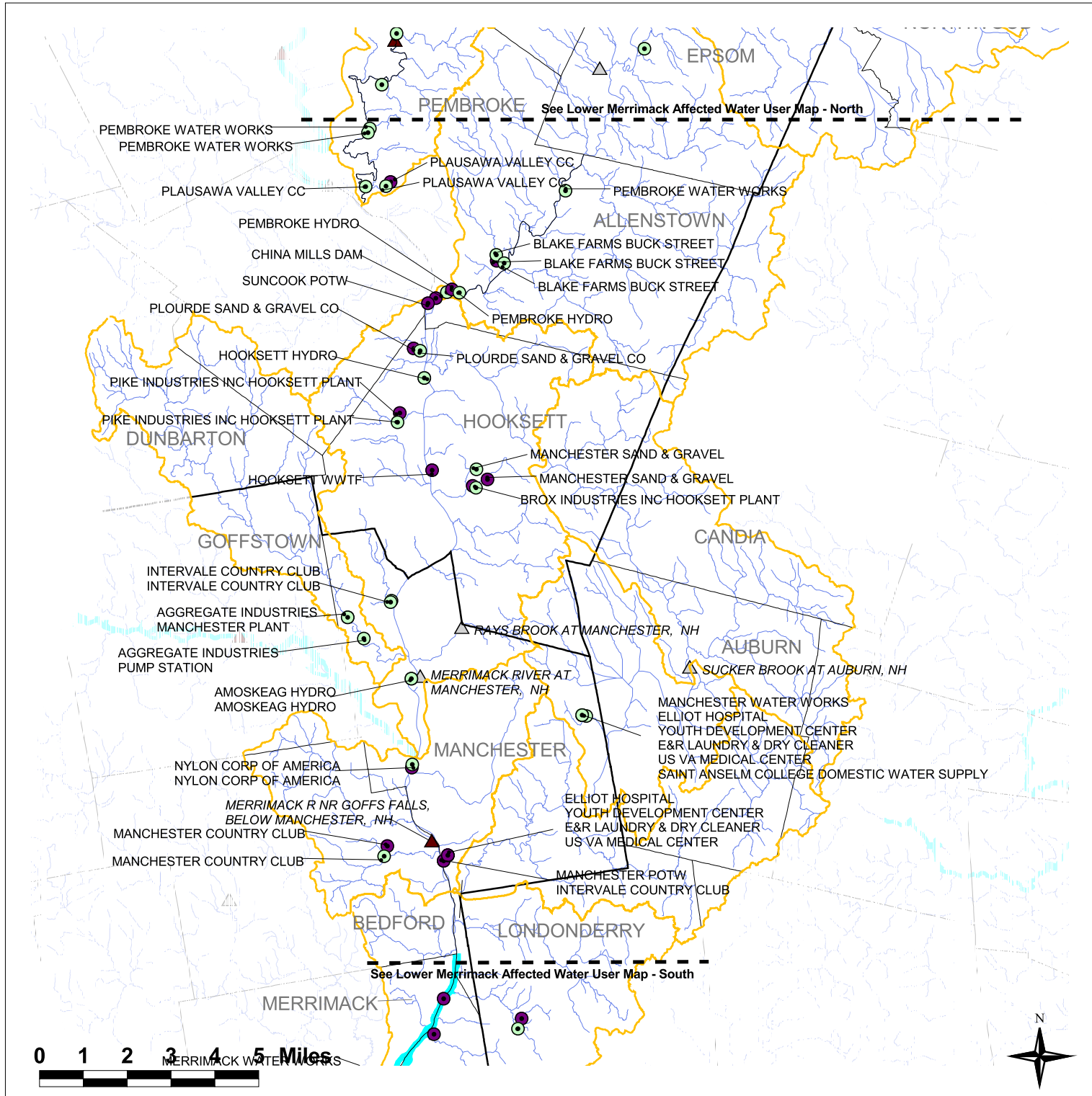
WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced May 27, 2004

h:\water quality\instream flow\gisprojects\wmpa\Merrimacklow\_waterquality.apr

# Lower Merrimack River Affected Water User Facilities: Source and Discharge Locations - Center



## Legend

### Affected Water Users

- Source
- Discharge

### Stream Gages

- Active
- Inactive
- Unknown



Designated Reach



Hydrology



State boundary



Town boundary



WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

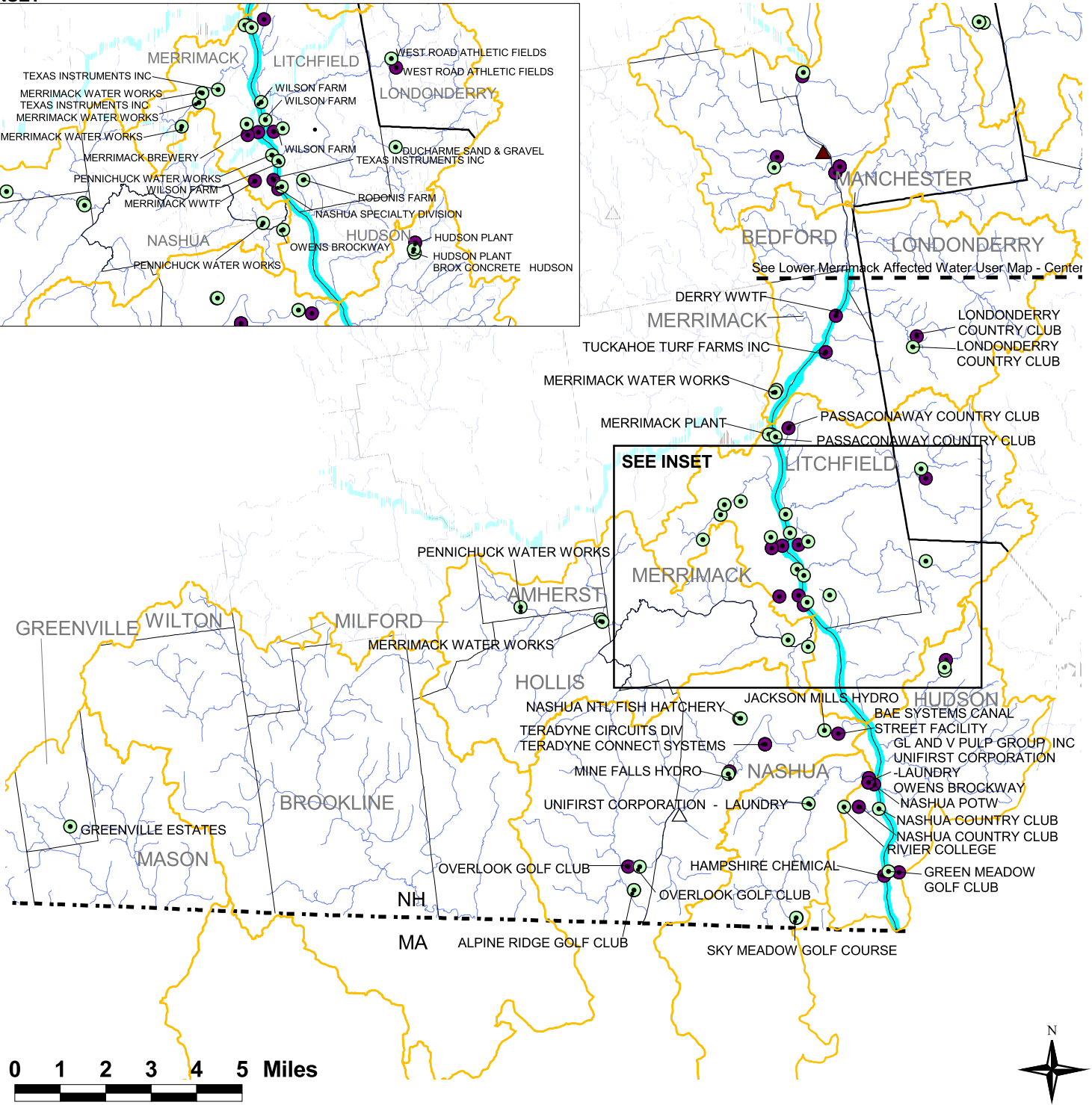
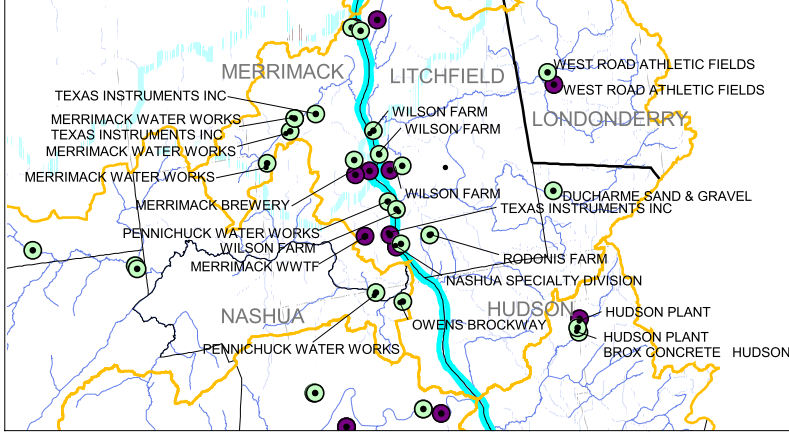
Map produced May 27, 2004

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# Lower Merrimack River Affected Water User Facilities: Source and Discharge Locations - South

## INSET



## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- Active
- Inactive
- Unknown



Designated Reach



Hydrology



State boundary



Town boundary



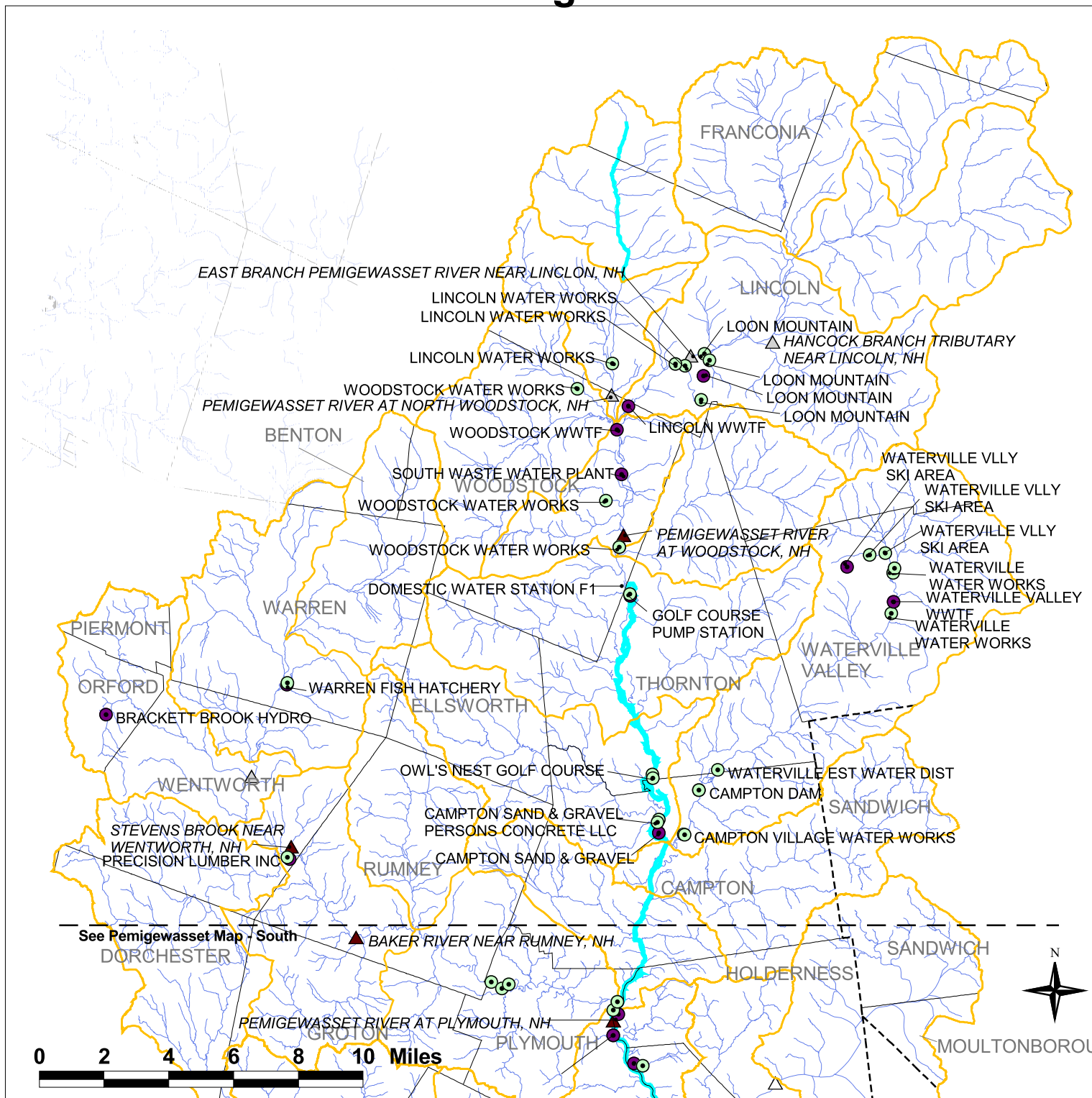
WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced May 27, 2004

h:\water quality\instream flow\gis\projects\wmpa\Merrimacklow\_waterquality.apr

# Pemigewasset River Affected Water User Facilities: Source and Discharge Locations - North



## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- ▲ Active
- △ Inactive
- △ Unknown



Designated Reach



Hydrology



State boundary



Town boundary



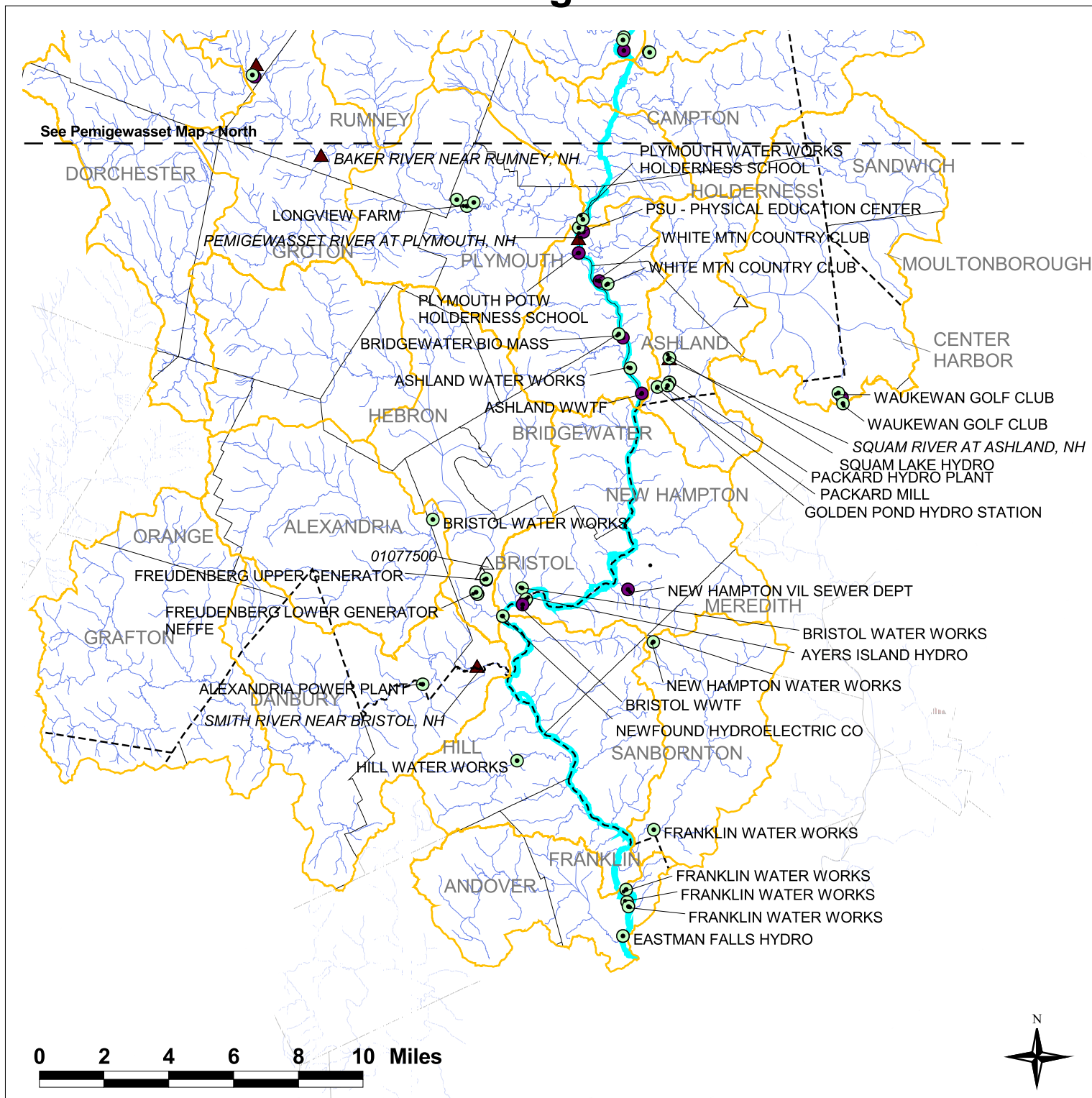
WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced January 28, 2004

h:\water quality\instream flow\gisprojects\wmpa\Ashuelot\_waterquality.apr

# Pemigewasset River Affected Water User Facilities: Source and Discharge Locations - South



## Legend

Affected Water Users

- Source
- Discharge

Stream Gages

- ▲ Active
- △ Inactive
- △ Unknown



Designated Reach



Hydrology



State boundary



Town boundary



WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced January 28, 2004






h:\water quality\instream flow\gis\projects\wmpa\Ashuelot\_waterquality.apr



# Piscataquog River Affected Water User Facilities: Source and Discharge Locations

## Legend

### Affected Water Users

-  Source
-  Discharge
-  Stream Gages
-  Active
-  Inactive

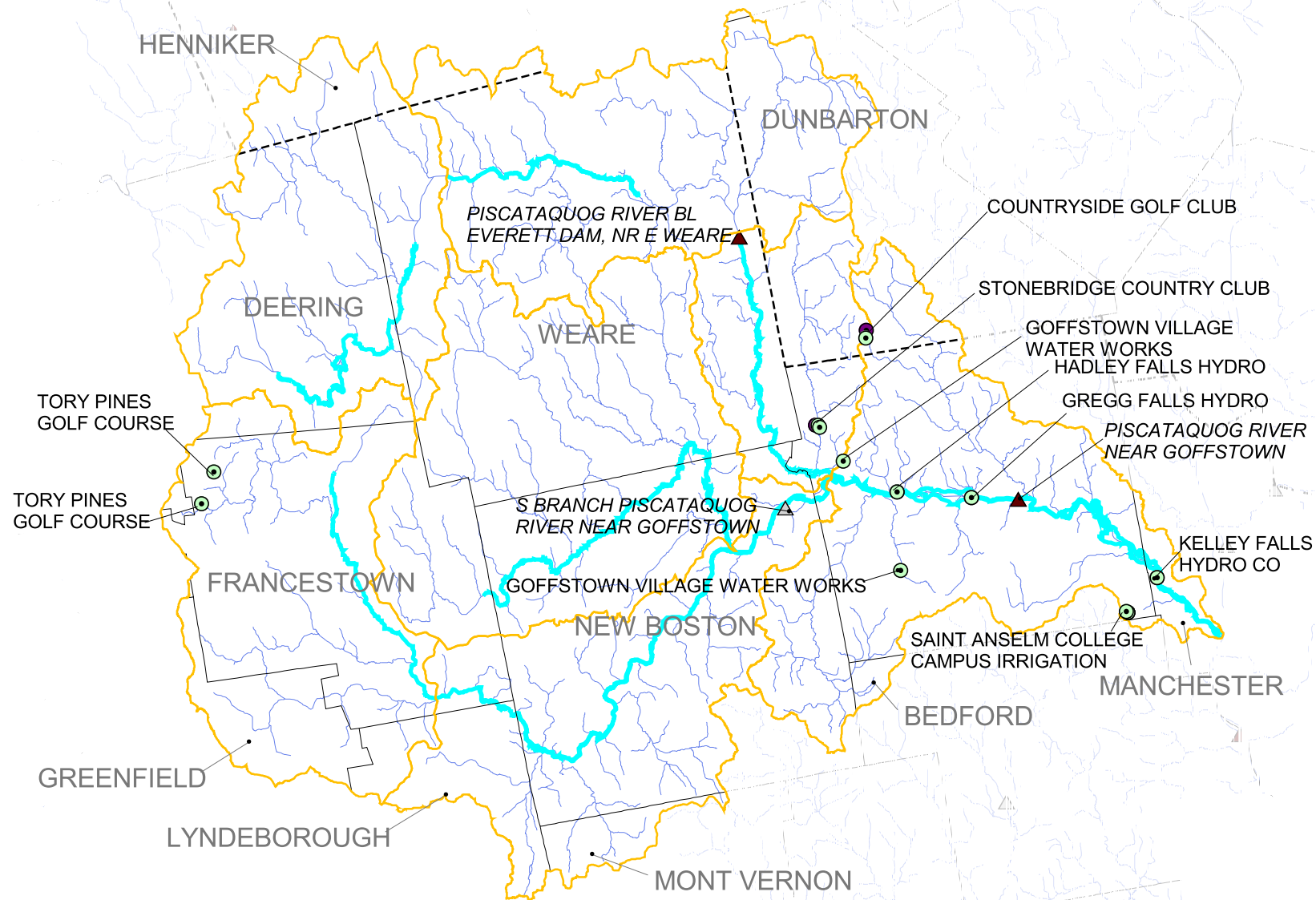
 Designated Reach

 Hydrology

 State boundary

 Town boundary

 WMPA



The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced January 30, 2004

h:\water quality\instream flow\gis\projects\wmpalPiscataquog\_waterquality.apr













0 1 2 3 4 Miles

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced May 26, 2004

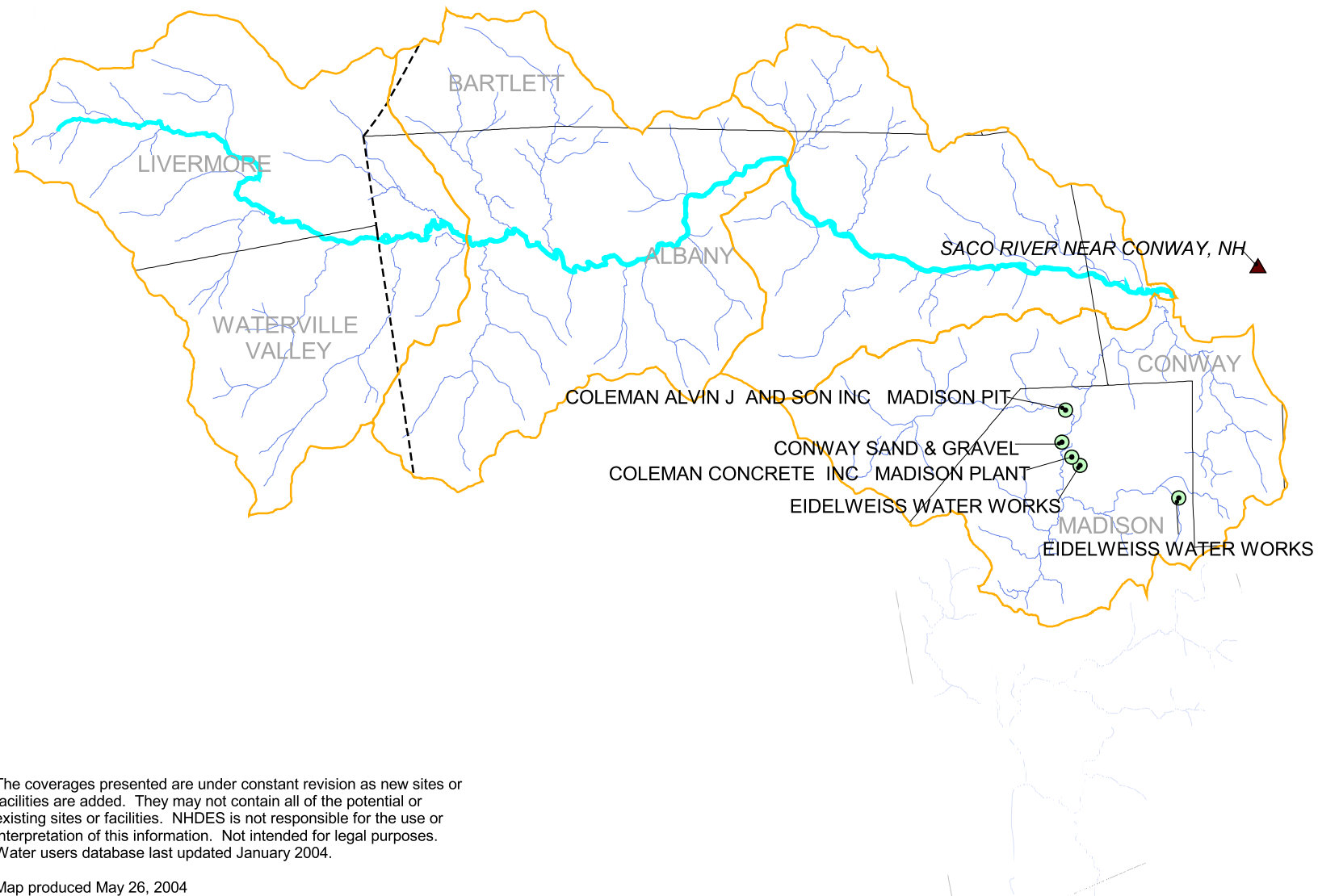
### Affected Water Users

-  Source
-  Discharge
-  Stream
-  Active
-  Inactive
-  Designated Reach
-  Hydrology
-  County boundary
-  Town boundary
-  WMPA



0 1 2 3 4 Miles

# Swift River Affected Water User Facilities: Source and Discharge Locations



## Legend

### Affected Water Users

- Discharge
- ⊙ Source

### Stream Gages

- ▲ Active
- △ Inactive

— Designated Reach

— Hydrology

- - - County boundary

— Town boundary

— WMPA

The coverages presented are under constant revision as new sites or facilities are added. They may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes. Water users database last updated January 2004.

Map produced May 26, 2004

h:\water quality\instream flow\gisprojects\wmpa\Saco\_waterquality.apr

1 0 1 2 Miles